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at 2.30 p.m.

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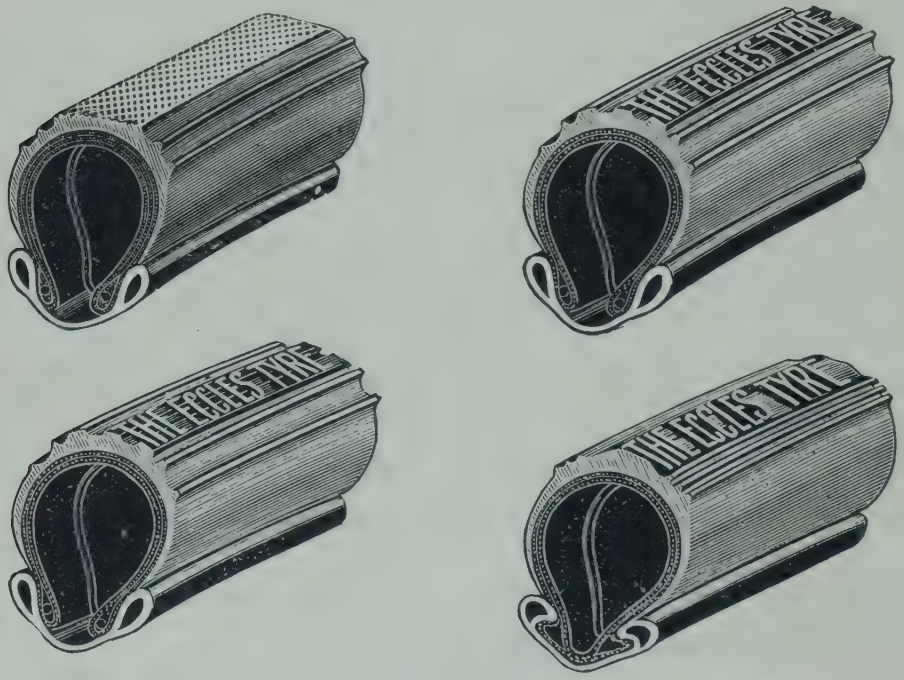

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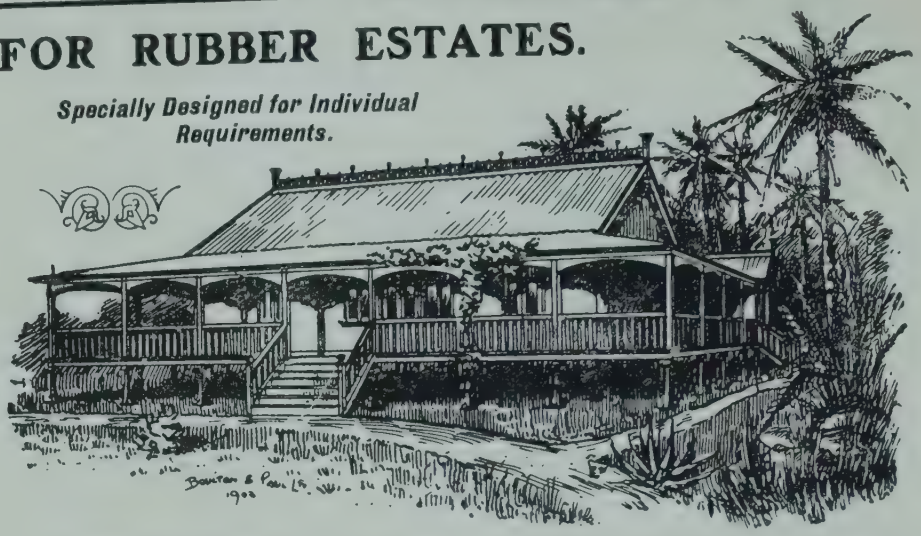

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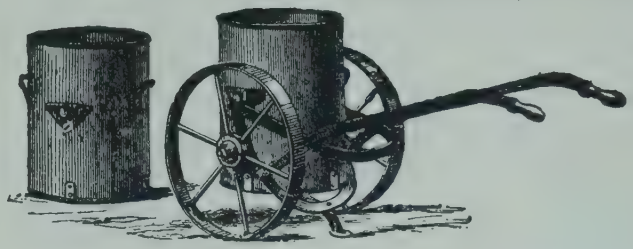

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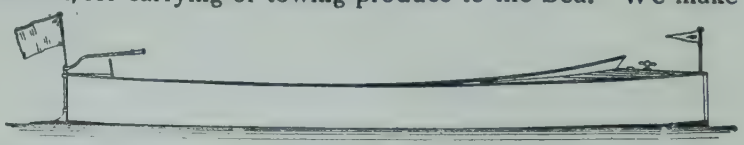

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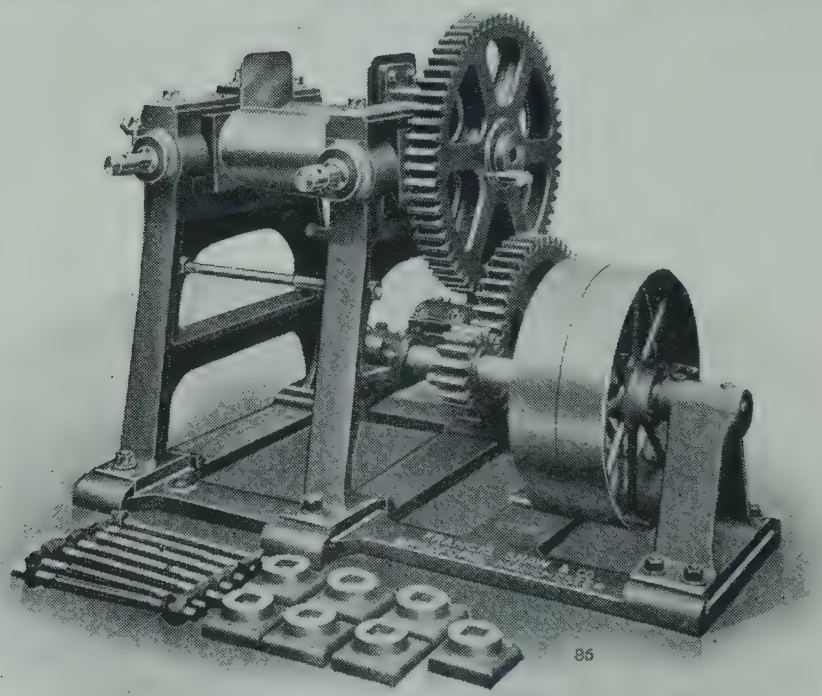

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FOREWORD.

BY

THE ORGANISING MANAGER.

In undertaking the organisation of the first International Rubber and Allied Trades Exhibition ever held, it was to be expected that there would be numerous and great difficulties to surmount; and although in the nature of things shortcomings are inevitable, I think visitors, many of whom, to my personal knowledge, are coming from every part of the globe, will admit that a thoroughly representative collection of exhibits has been gathered together. Although this is the first *International* Rubber Exhibition and the first in this hemisphere, we gladly acknowledge the Rubber Exhibition held at Ceylon in 1906, which was presided over by Sir Henry Blake, G.C.M.G., our own worthy president, as its parent, which I hope and believe its offspring will not disgrace.

I know that the Committee appreciate as greatly as I do the extremely valuable and kind assistance which Sir Henry Blake has given us, and I wish to tender to him my respectful thanks for all he has done, and for the great interest he has taken in even the most uninteresting details of the work in hand.

I also wish to take this opportunity of thanking the members of the Committee in all parts of the world. I cannot thank them all personally, because many of them I shall probably never see, but I have received from them most useful advice and assistance, which has been of the greatest service to me in making this Exhibition what you find it; and if, as I believe will be the case, you come to the conclusion that for the first of its kind it is exceptionally successful, this success is in a great measure due to the valuable help I have received from the gentlemen I have above referred to.

I think it right to state that this Exhibition was first suggested to me by Mr. H. Hamel Smith, the Editor of *Tropical Life*, who has rendered me every assistance, and his help has been much appreciated by the Executive.

In conclusion, I beg to thank the exhibitors most sincerely for their magnificent and generous support, and I should also like to extend my thanks to several important English and Continental manufacturers, who although not able, for various reasons, to take part in the Exhibition, have, nevertheless, encouraged me by their sympathy and good wishes for its success.

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INTRODUCTION

BY

SIR HENRY A. BLAKE, G.C.M.G.,

(Ex-Governor of Ceylon, Bahamas, Newfoundland, Jamaica and Hong-Kong).

(President first Rubber Exhibition held in the world—Ceylon, 1906.)

THE first Rubber Exhibition held in Europe bids fair to mark an era in an industry of great national importance, for the time has arrived when it behoves Producer, Chemist and Manufacturer to take into consideration the history of the past, the development of the present, from seed to finished product, and the immense possibilities of the future for a substance that enters into the composition of thousands of processes in divers directions at present, and the uses of which may be indefinitely extended. Although India Rubber was noticed in the island of Haiti by Herera during the second voyage of Columbus, it was first introduced into France in 1735, and was not practically known in England until a later date, when half-inch cubes were sold for 3s., or between £4 10s. and £5 per lb., a price to make the planter's mouth water. But a century elapsed before it could be said to have come into general use; and in 1830 the import to England was represented by 464 cwts. The import of 33,364 tons in 1907 shows how enormously the uses of rubber had expanded, and to-day it does not yield to cotton, linen, silk wool, or hair in importance as an agent for the advancement of trade and the comfort and happiness of humanity; for without its aid the cable communication that binds the whole world in friendly bonds could not have been established.

Rubber, as a generic term, while presenting similar leading characteristics, is extracted from many different plants, each family of which has its own peculiar qualities requiring special treatment. The three principal groups are the Para, or *Hevea Brasiliensis*; The Ceara, or *Manihot Glaziovii*; and The Madagascar, or *Vahea Madagascariensis*. The Para Rubber seed was first procured by Mr. Wickham for the Royal Botanic Gardens at Kew in 1876, and was destined for India; but regulations against its importation deflected the consignment to Ceylon, where

the first seeds were planted in the Botanic Gardens at Heneratgoda, from which parent trees have sprung all the Para plantations now flourishing in the East. The Ceara rubber has also been extensively planted, and in the Rubber Exhibition held in Ceylon in 1906, Ceara biscuits grown at an elevation of 3,500 feet won the first prize. Of the Madagascar Rubber, in which, I believe, is generally included the various kinds of African rubber, I know nothing, but the broad fact remains that while plantation rubber stands out for its superior cleanliness and freedom from impurities, the standard of excellence for tenacity and resilience rests with hard Para. Whether these superior qualities are due to the age of the trees, the peculiarity of climate and situation, or the process of curing with the smoke of a particular nut, remains to be discovered; and in the interest of every person who has invested his money in rubber plantations, as of the manufacturers who are engaged in the preparation for the markets of the world, the discovery of the reason why is of primary importance.

To enumerate the thousands of uses to which rubber has been put would require a volume. Its value as a flexible insulator, its resilience, and its practical indestructibility is acknowledged, and day by day its uses are extending; but we have yet to find a rubber waterproof that will stand the moist heat of the Tropics; we have yet to learn the conditions of climate and cultivation under which the various rubber producing trees will thrive best, mature most rapidly, and yield the largest percentage of caoutchouc in the latex; and we have further to stimulate in friendly competition the inventive genius of those who create the want, and cater for the desire of the appreciative consumer. Great as has been the extension of the past, it is but the beginning of a still greater expansion, and with the broadening of the basis of consumption, the producers of rubber may look forward with confidence to a good and steady return for the expenditure of time, capital and labour.

To this end, the meeting of all classes interested in rubber must conduce, and I hope that this important Exhibition, supported as it is by the governments of almost every rubber producing country in the world, may amply justify the confident expectation of its promoters.

Henry A. Blake

President.

SIR HENRY A. BLAKE, G.C.M.G.,

President

International Rubber and Allied

Trades' Exhibition.

Photo by permission Ed. "Tropical Life.

PATENTS AND . . . DESIGNS ACT, 1907.

Upon the application of Mr. A. S. Manders, of 75, Chancery Lane, W.C., made to the Board of Trade on the 23rd day of January, 1908, the Board of Trade do hereby certify that the Rubber and Allied Trades Exhibition proposed to be held in the year 1908 at the Royal Horticultural Hall, Westminster, in the County of London, is an International Exhibition.

Signed, by order of the Board of Trade, this 27th day of January, 1908.

T. W. P. BLOMEFIELD,

Assistant Secretary, **Board of Trade.**

PART I. PATENTS. Provisions as to exhibitions.

Section 45 (1). The exhibition of an invention at an industrial or international exhibition, certified as such by the Board of Trade, or the publication of any description of the invention during the period of the holding of the exhibition, or the use of the invention for the purpose of the exhibition in the place where the exhibition is held, or the use of the invention during the period of the holding of the exhibition by any person elsewhere, without the privity or consent of the inventor, shall not prejudice the right of the inventor to apply for and obtain a patent in respect of the invention or the validity of any patent granted on the application, provided that :—

(*a*) The exhibitor, before exhibiting the invention, gives the comptroller the prescribed notice of his intention to do so ; and

(*b*) The application for a patent is made before or within six months from the date of the opening of the exhibition.

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CONDITIONS OF ADMISSION.—No person other than an Exhibitor, or an Exhibitor's Representative, is allowed to canvass Visitors or Exhibitors for orders, or for any purpose whatsoever, or take sketches or photographs from the Exhibits. Any transgression of this rule renders such person liable to **immediate expulsion from the building.**

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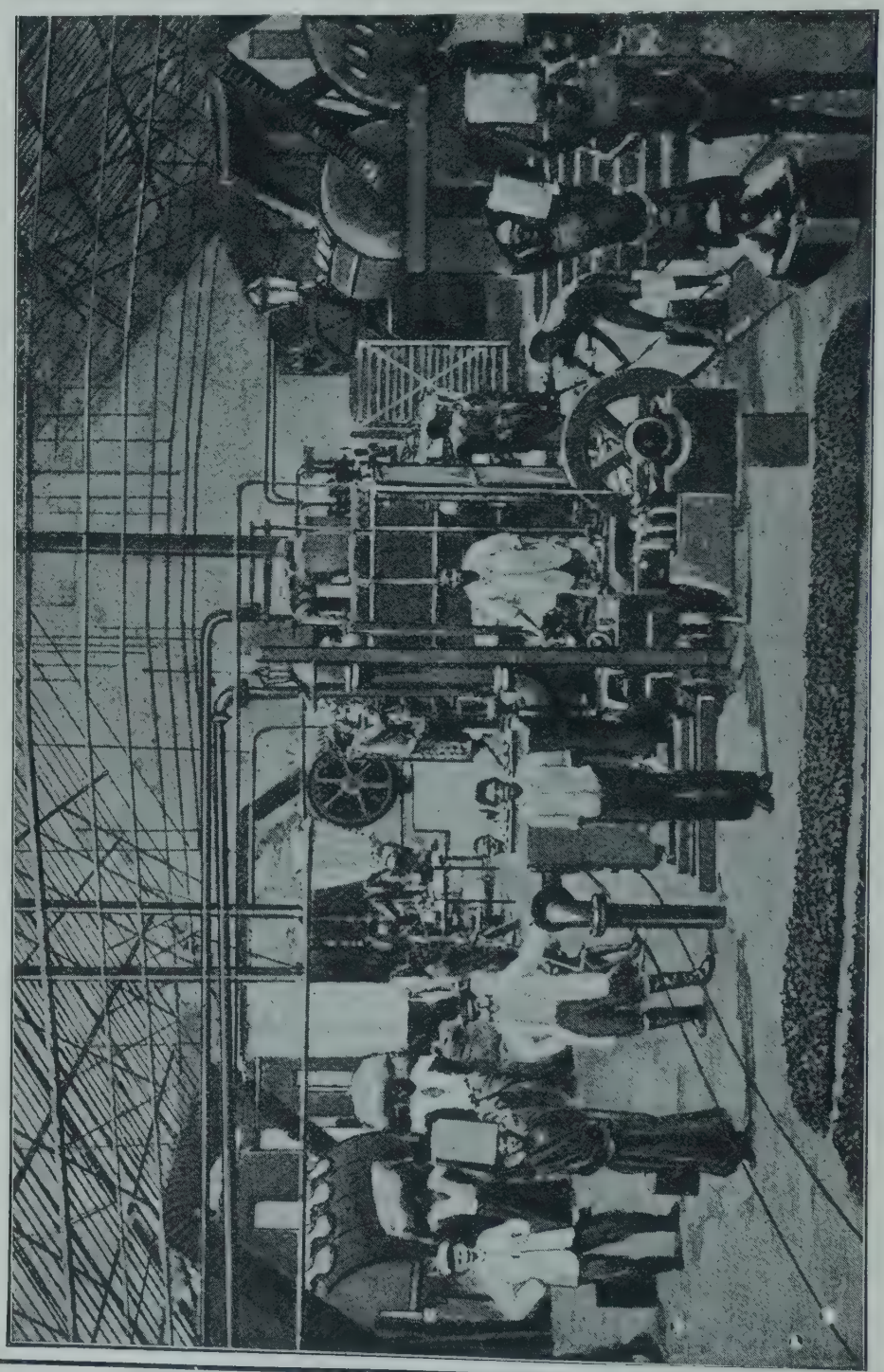

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OF THE

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——TO MAKE ENQUIRIES IN——

Reference to the

VALUE OF EXHIBITIONS.

COMMITTEE:

Lord AIREDALE, Sir ALFRED BATEMAN, K.C.M.G. (Chairman), Sir SWIRE SMITH, Sir ISIDORE SPIELMANN, Mr. A. WILSON FOX, C.B. (Board of Trade), Mr. CHARLES A. HARRIS, C.B., C.M.G. (Colonial Office), Mr. ALGERNON LAW (Foreign Office), Mr. MALCOLM RAMSAY, C.B. (Treasury), and Mr. SAMUEL J. WARING.

* * * * * *

Another consideration which appears to weigh with Manufacturers of standing is the unbusinesslike and undignified manner in which they are apt to be mixed up with (*a*) what they call "fakers," *i.e.*, the paltry dealers in cheap articles of ornament and amusement which do not represent British industry; and (*b*) the general element of popular amusement which has become part of the life of the modern Exhibition. There is an opinion that Exhibitions are kept open less with a view to the furtherance of trade interests than with the object of attracting visitors and achieving financial success from the receipt of gate money The number of side shows and other entertainments has, in consequence, increased to a very great extent at recent Exhibitions, and it is thought by many that this has resulted in attracting, as visitors to the Exhibition, pleasure seekers, rather than serious students or possible customers. There is no doubt that, in the opinion of many Manufacturers, the changes to which we have alluded have materially diminished the value of exhibiting as a means of obtaining direct orders for their goods.

NOTE.—There will be no "faker" stands or side-shows, as above mentioned, at the Rubber Exhibition, and every effort will be made to attract the class of visitors who will benefit the Exhibitors.

* * * * * * *

To a large extent it would appear the amount of direct benefit which may be derived from exhibiting by any particular Firm is dependent on whether that Firm is represented at the Exhibition by an efficient Agent. In many cases, it is said, the attendants in charge of a Stall at an Exhibition are unable to describe the goods exhibited in a correct and intelligible manner.

* * * * * * *

A number of Firms who, from the nature of their Exhibits, can expect little or no direct return to compensate them for their outlay, still continue to exhibit at fairly frequent intervals. In doing this many have no doubt been influenced by the fear that they might lose their place in the trade if they failed to be represented at Exhibitions when their competitors were showing; but there are, on the other hand, not a few who regard their expenditure on Exhibitions in the light of a necessary item in their general scheme of advertisement.

* * * * * * *

To a large extent the question which we have to decide is not whether it pays to exhibit, but whether, under modern conditions, we can afford not to exhibit. We think that the evidence which we have obtained affords convincing proof that the answer to this question is in the negative.

* * * * * * *

It is difficult to find important arguments against Exhibitions whose utility as a whole is admitted. Some criticisms in the case of special commodities based on expense and distance, and doubts whether the benefits equal the outlay, seem to be the principal, but for the most part opinions are in favour of Exhibitions.

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INTRODUCTION

TO THE

RAW INDIA RUBBER SECTION.

BY

DR. D. SPENCE.

THE india rubber of commerce is derived from the latex-secretion of certain trees, creepers, and shrubs by a process which is known technically as coagulation. The plants known to yield rubber are very numerous, but only a few of them yield products of such a quality that they can be regarded as the sources of the world's supply of raw india rubber. For this and other reasons, by far the greater part of the rubber of commerce comes from the tropical American regions where the valuable species of *Hevea*, *Manihot*, *Sapium*, *Micrandra*, *Hancornia*, and *Castilla* are indigenous, while the rest comes from tropical Africa, and from the valuable species of *Landolphia*, *Funtumia*, *Ficus*, *Carpodinus*, etc., indigenous to this country. The Asiatic or Indo-Malayan region, with its native species of *Ficus*, *Willughbeia*, *Urceola*, *Parameria*, etc., is in a minor or third-rate position of importance to-day, although with the ever steadily and rapidly increasing cultivation of introduced species of *Hevea*, *Manihot*, and *Castilla*, it is impossible to foretell with any degree of accuracy what the position of the rubber industry in this region may rise to be.

India rubber is, in short, the dried up or coagulated latex of the plant. It is obtained in such a variety of ways from the latex at the present day, that one can hardly wonder if the various brands of raw india rubber on the market show very great differences amongst themselves. It is doubtful, of course, whether pure india rubber or caoutchouc is the same substance in the physico-chemical sense, no matter from what botanical source it has originated; nevertheless, there is every reason for believing that by suitable methods of collecting, preparing, and coagulating the latex from different parts, a more standard product would be obtained, and the inferior brands of raw india rubber on the market could be materially improved. In the process of coagulation alone a great deal can be done to improve or to detract from the value of the resulting rubber. For this reason an account of the various methods of coagulation in use in different parts of the world may not be without interest.

METHODS OF COAGULATION.

1.—By heat.
- (*i.*) By artificial heat.
  - (*a*) Dry heat or smoking: On the Amazon, Brazil; in New Caledonia.
  - (*b*) Moist heat or boiling: In Mexico and in West Africa for *Funtumia elastica* and *Landolphia* latices.
- (*ii.*) By natural heat.
  - (*a*) Separation by the soil: In Angola.
  - (*b*) Separation by human body: In Congo, Angola, etc.
  - (*c*) Evaporation on level ground: In Ceara, Angola.

2.—By skimming.
- (*a*) Skimming after the addition of water, draining, washing, and pressing: In Bahia, Congo.
- (*b*) Skimming by mechanical or centrifugal means, combined with coagulation by means of acid: In experimental stage in Ceylon and F.M.S.

3.—Coagulation by chemical means.
- (*a*) Mineral acids and mineral reagents: In Gambia, Senegal, Mozambique, Matto Grosso, Pernambuco, Maranhao.
- (*b*) Organic acids and extracts of plants, etc.: In Ceylon and F.M.S., also Peru, Guatemala, Gambia, Madagascar, Upper Congo, German E. Africa, etc.

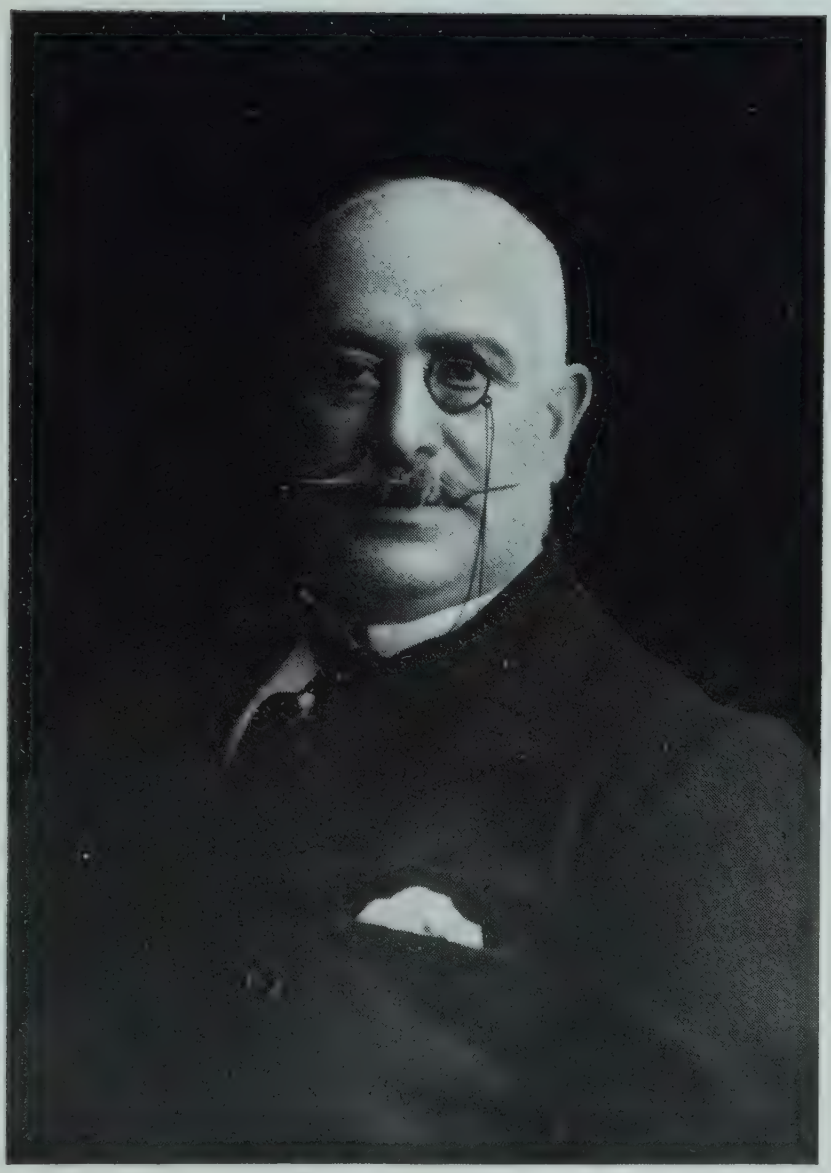
4.—By beating and maceration: For *Landolphia* and other root rubbers—West Africa and German East Africa. For "Guayule" in Mexico.

5.—Chemical treatment, followed by extraction of the caoutchouc by solvents, etc.:—For "Guayule" in Mexico, etc.

1 (1a).—Coagulation by means of Artificial and Dry Heat or Smoking.

This method, although one of the oldest, seems to be especially suitable for the Heveas and Micrandras, and it is mainly in use for the preparation of Para rubber on the Amazon, although it has also been employed in other parts of Brazil, and has been adopted in Venezuela and Guiana. It can still be described as the method by which the best caoutchouc on the market is obtained.

The latex, collected in cups from incisions made in the bark of the tree is poured into a pail or a large gourd bottle, and the empty cups are replaced in the same positions from which they were taken. When the whole of the latex has been collected, it is brought to the hut of the native, where a fire is lit in a fireplace which has been scooped out of the ground. On the lower Amazon the fruits of the Urucuri or the Naussu palm (*Attalea excelsa* and *Manicaria saxifera*) are added to the faggot fire, which increase the thickness of the smoke.



COLONEL W. J. BOSWORTH,

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As soon as sufficient smoke has developed, the cauchero takes the palette, a wooden instrument with a handle 3 to 6 ft. long and holds the broad, flat end of this form over the smoke for a moment, dips it then into the pail containing the latex, and back again into the smoke in order to coagulate the latex which has adhered to it. This process is repeated until the caoutchouc layers have become sufficiently thick, when the lump of raw rubber is then cut off, dried for several days, and despatched, usually as "fine Para biscuits," to the nearest trading centre. It is believed that the smoke from the palm nuts possesses valuable antiseptic properties, on account of the presence in it of small quantities of creosote and other substances, and it is highly probable that the excellent quality of Para rubber is due as much to the method of its preparation as to the exceptional properties of the latex from which it is prepared.

Para entrefine, Negro Heads, Sernamby, are but less pure varieties of fine Para, prepared usually from the rubber which adheres to the tree during tapping and to the vessels containing the latex.

1 (1b).—Coagulation by means of Moist Heat or Boiling.

This is a primitive method employed by the Indians in Mexico to coagulate *Castilla* latex, and it is extensively used in Africa for the latex from *Funtumia elastica*. The latex, which is collected in a piece of bark or in a pot, is sometimes passed through a sieve into a boiler under which a faggot fire is lit. The raw caoutchouc slabs obtained by collecting the separated caoutchouc and squeezing it into slabs is of inferior quality. The method has many grave defaults, and in recent years Mexican rubber has been improved in colour and odour by improved methods of treatment.

Boiling the latex has also been carried out in British India, and the preparation of the latex from *Ficus elastica*, which gives the Assam caoutchouc, is done in the same way.

1 (2a).—Coagulation by Natural Heat.

Coagulation by natural heat is still in use in East and West Africa, where the negroes tap the trees regardless of the effect of the cutting. The latex flows on the ground, where it coagulates the water disappearing by evaporation and absorption. Several tribes on the Congo and elsewhere collect *Landolphia* rubber in this way, and the product is consequently of very inferior quality.

1 (2b).—Coagulation by Natural Heat. Evaporation on the Human Body.

This method is in vogue amongst the African natives. The negro when tapping the lianes collects the latex in the hollow of his hands. He then smears the material over his body, and as soon as it has dried it is torn off in shreds and rolled into balls, Dr. Welwitsch states that several Angola tribes use the same method.

1 (2c).—Coagulation by Natural Heat—on other surfaces than the soil.

Brazil is the home of this method, which is used for making Ceara caoutchouc (Ceara scraps) out of *Manihot glaziovii* latex. The process is also known in West Africa and India.

In Ceara the tree is tapped when about three years old, and the ground is covered with banana leaves to collect the dripping latex. Cuts are made from the bottom upwards to a height of about 6 ft. in all directions, and the latex of *Manihot*, being much thicker than that of the Heveas or Castillas, runs very slowly, and only infrequently flows to the ground. The coagulated caoutchouc is stripped off the tree, collected, and rolled into balls. Ceara caoutchouc prepared in this way contains a large quantity of mineral and vegetable material, which detract from its value, and is not, therefore, surprising that better methods of coagulation for *Manihot glaziovii* have been adopted with success in other parts—German East Africa, Ceylon, etc.

2 (a).—Coagulation by Skimming after Dilution with Water.

This method is used in connection with the latex from *Hancornia*, and on the Congo for coagulating the latex from *Landolphia*. It has been used also in Bahia, in several places near Nicaragua, in Central America for the *Castilla* latex, and in Assam, where the latex of *Ficus* is prepared. In short, the mixed latex and water are allowed to stand quiescent for a time. The caoutchouc rises to the surface, is taken off, kneaded until it becomes compact and partially dried. In this form it is put on the market, or it is cut up into small squares or "thimbles." The method yields inferior products, and much better results have been obtained for Landolphias by other methods of treatment. The raw rubbers obtained in this way (*see* specimens) all contain too much moisture, in addition to uncoagulated latex. Fermentation soon makes itself evident by its characteristic and obnoxious odours. Partial washing of the raw product is sometimes undertaken, but the product is spongy, with many holes containing putrescent mother liquor. The loss on washing of rubbers prepared by this method is very great.

2 (b).—Skimming by Mechanical or Centrifugal Means.

This method is not much more than in its experimental stages yet. The separation of the caoutchouc particles is effected by means of centrifugal force. The method has been tried in some rubber estates, but without much success. It is doubtful if the latex from *Hevea braziliensis* can be dealt with effectively by this method. Centrifugalisation, however, is used as a quick means of separating the caoutchouc after agglutination by means of acid.

3.—Coagulation by Chemical Means.

(a) Mineral Acids and Inorganic Salts.

In Maranhoa and Matto Grosso sulphuric acid has been used for the rapid coagulation of the latex, and is still in use, but results obtained by means of it are not very satisfactory. Sea salt has, however, largely taken the place of sulphuric acid in the two provinces which formerly used the acid. Several African caoutchoucs, such as those from the Ivory Coast, Cameroons, and the Congo are prepared by treatment with salt water. In some parts the incisions in the lianes are brushed with salt water, and the coagulated caoutchouc is drawn out and wound into a solid ball. Alum also acts as a powerful coagulant, and is used in Pernambuco and Maranhoa for the coagulation of *Hancornia* latex. The rubber prepared by the addition to the latex of a solution of alum deteriorates rapidly, and unless the product is washed thoroughly free from alum it very soon becomes of little market value.

In Peru, *Hancornia* latex is also coagulated by means of soap suds. The soap solution is mixed with the latex, and the whole is beaten by hand to facilitate coagulation.

Other inorganic reagents, such as iron trichloride, corrosive sublimate, calcium chloride, have been recommended as coagulants, but it is doubtful if they are employed in practice.

(b) Organic Acids and Extracts of Plants, etc.

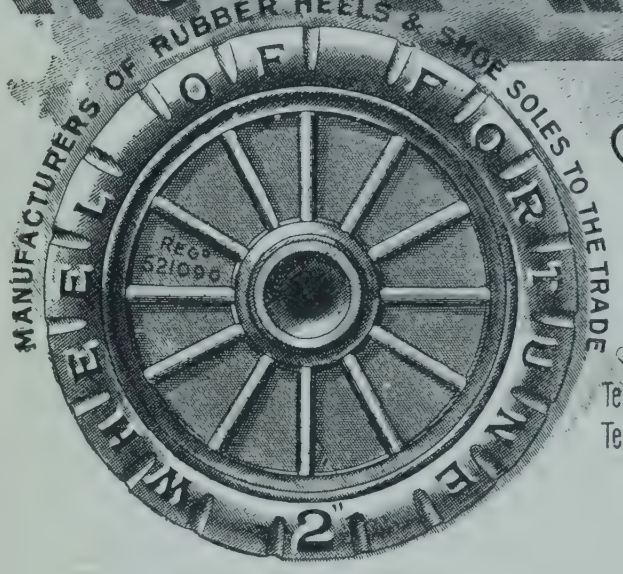
This includes a great variety of coagulants and coagulation methods, and into each it is impossible to go. In Ceylon and the F.M.S. the latex from *Hevea braziliensis* is coagulated by the addition to it of dilute acetic acid, or acetic acid with alcoholic creosote. This latex is alkaline to litmus, and just enough acid is added to render it faintly acid. The caoutchouc separates rapidly after acidifying. This method of coagulation has been well studied, and it is being applied in other parts. Formic acid might be used with advantage to replace acetic in this connection.

Many African latices are coagulated by the addition to them of watery extracts of the leaves or stems of certain plants. Coagulation is usually brought about by the acid juices extracted from the plants. "Ofruntum" rubber is coagulated in some parts by treating it with a boiling effusion of Niama (*Bauhinia reticulata*), and *Landolphia* latex is sometimes coagulated by an effusion of a plant which is common over tropical Africa (*Costus lucanusianus*).

Landolphia latex is frequently coagulated by extracts coming from the Aurantiaceæ, and it is reported that *Manihot glaziovii* in German East Africa is coagulated by an acid extract of the fruit of *Adansonia digitata*. In Madagascar, Gambia, Peru, Guatemala, Nicaragua, similar methods of coagulation are used.

Phenol, Thymol, etc., have also been used as organic coagulants.

The Rubber Heel Manufacturing Co



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This is a method which is becoming more and more in vogue for the extraction of root rubbers on the Congo and elsewhere. The roots are dug up, cut into lengths, which are usually allowed to dry in the sun for some time. They are then soaked for several days in water, and the coagulated caoutchouc is beaten out with flails and collected. The rhizomes are treated in a somewhat similar fashion. "Guayule" rubber is also extracted from the shrub *Parthenium arge tatum* by this method.

GUTTA.

Gutta is obtained from the latex of various members of the *Sapotaceæ*, particularly *Palaquium* and *Payena*, growing in Indo-Malaya. It differs from caoutchouc in being harder, not extensible, and in softening with heat.

At one time the chief source of gutta was *Palaquium Gutta*, Burck. It appears to be now quite extinct, except in cultivation, and gutta is obtained at the present time from other species of *Palaquium* and from *Payena Lerrii*, Kurz.

BALATA.

Balata is obtained from the latex of various species of *Mimusops*, particularly *M. Balata* Crueg. These plants are members of the *Sapotaceæ* growing in Guayana.

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THE TREATMENT OF RUBBER

BY

JOSEPH TORREY, A.M., PH.D.

INDIA RUBBER, or Caoutchouc, is obtained from the milky sap or latex of certain trees, creepers, and shrubs mostly tropical. The rubber is obtained from the latex, sometimes by warming it, sometimes by simple exposure to the air, and sometimes by the addition of small quantities of chemicals, such as alum, sulphuric acid, or carbolic acid. In any case, the rubber separates as a tough elastic mass, which is usually brought to the market without much attempt at purification. Sometimes the natives allow the milk to run from the tree, or creepers, over their bare arms and shoulders, rubbing it off and rolling it up into small lumps as fast as it dries.

The Brazilian natives have a method of their own. A paddle-shaped implement is dipped in the "milk" (which has been collected in a large vessel), and is then held in a very thick smoke. This brings about immediate coagulation, and a thin film of rubber is deposited on the paddle. The process is many times repeated, till a ball or biscuit of rubber, weighing from 6 to 30 lbs., has been collected. This is then cut off, and the process begun anew. Rubber prepared in this way was first shipped from the South American port of Para, and this has given the product its name—the best and most carefully prepared being called *fine Para*. It represents the very best of the native methods for dealing with rubber milk. As a whole, however, the methods by which rubber is brought from the tree, in whose latex it exists, to the crude rubber dealer, are far from satisfactory.

Within the last ten years or so the planting and cultivation of certain varieties of rubber-producing tree has been undertaken—notably in Ceylon, as well as in the vicinity of the Straits and in Mexico. All conditions are most carefully studied, and the results are most encouraging, especially as to the purity and uniformity of the rubber sent to the dealers by the planters. It is more than probable that the existence of these much improved methods will, in time, react more or less on the present methods of collecting wild rubber.

The price of Fine Para before washing and drying, that is to say, in practically the condition in which it comes from the native collectors, has quite recently been as low as 2s. 9d. per lb., while in May, 1905, it was 5s. 9d. per lb. These are both extremes.

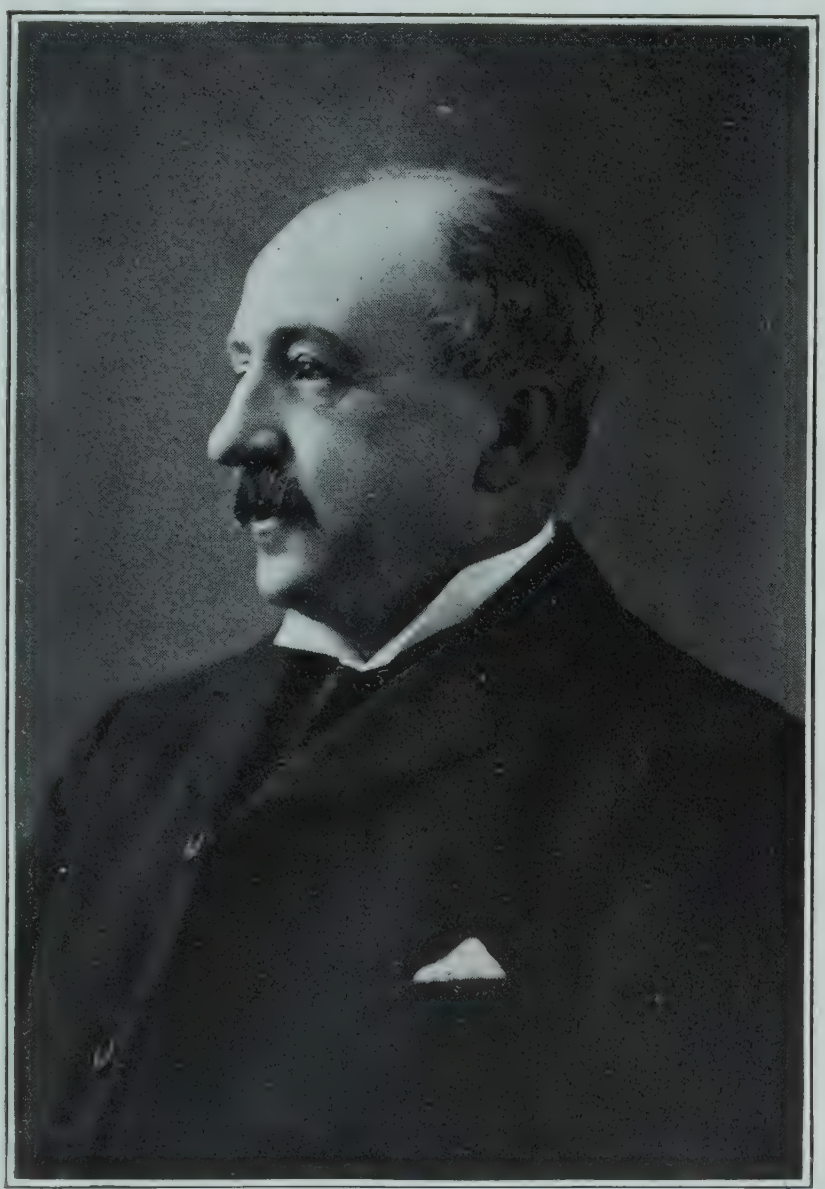
On being received at the factory, all crude rubber requires careful washing and drying, in the course of which different brands lose from 7 per cent. to 45 per cent. Fine Para shrinks from 15 per cent. to 18 per cent. Some African varieties shrink from 6 per cent. to 8 per cent., and some 40 per cent. to 45 per cent. It is not surprising, therefore, that while the prices in the crude state vary greatly, the washed and dried factory costs vary far less: for example, there is no practical difference in "washed and dried cost," between Fine Para at 4s. per lb., shrinking 15 per cent., and Madagascar at say 2s. 6d. per lb., shrinking 45 per cent. Indeed, in this case, the Para is cheaper when the quality of the washed and dried rubber is considered.

It will now be seen that the rubber goods manufacturer has to deal with a decidedly expensive raw material. This, however, is only one of his tribulations. The following facts are responsible for a numerous train.

Pure washed and dried rubber is not of itself available as a manufacturing material. Of course, it is plastic, elastic, etc., at the ordinary temperatures, and could be moulded or drawn into the forms required for various articles, but the articles would be of no commercial use. In warm weather they would be soft, sticky, and inelastic; in cold weather, they would be hard and brittle. This enormous handicap was once for all removed by the patents of Goodyear (1839) and Hancock (1843). Both these investigators found that by thoroughly mixing the rubber with a relatively small amount of sulphur, and heating the mixture, a product was obtained which was practically unaffected by ordinary temperature changes, and was not sticky. With the aid of this process (called vulcanisation), it is possible to manufacture many articles by pressing the mixture of rubber and sulphur into an iron mould, which is subsequently heated to the right temperature, and for the right time for vulcanising. In some cases it is better to shape, or build up the article to the right form, and then vulcanise by heating for the required time in steam of the proper temperature, no mould being used ("open heat" vulcanisation). Still another class of articles, such as surgeons' gloves, toy balloons, etc., are vulcanised by dipping them for a few seconds into a mixture of bisulphide of carbon, with a very small amount of chloride of sulphur ("cold vulcanisation"). In this case it is not necessary to add sulphur. Rubber shoes and boots are vulcanised in hot air stoves, the heat being usually supplied by steam pipes ("dry heat" vulcanisation).

In all these cases, the effect is, broadly speaking, the same. The finished article has a certain determined degree of strength, elasticity, etc., which it will retain through a wide range of temperatures and for a suitable term of service.

Thus far we have only dealt with rubber and sulphur as though they were the sole materials used; but this is the case in only about 10 per cent. of all the rubber goods manufactured. One



H. KERR RUTHERFORD, ESQ.,

Chairman

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reason is that, with the ordinary prices of rubber, the goods would cost too much. They would be unsaleable, but this is not all. In many cases they would not be suitable. The inner tube of a cycle tyre, a rubber heel, a railway steam hose and a buffer are very different articles, and each requires its own set of physical properties. Take, for example, a cab tyre : a high-class article of this description only contains about 50 per cent. (often less) of pure rubber. Some cheap packings contain not more than 25 per cent. This, however, is not in any proper sense *adulteration* any more than the making of concrete from hydraulic cement, sand, and broken rock is an adulteration of the cement. In both cases it is an entirely legitimate use of materials to obtain a given constructive and commercial result. In the case of rubber, the manufacturer uses two principal classes of so-called "compounding materials." These may be briefly characterised as follows :—

1. Coloured powders, used because they impart to the finished article the colour demanded by the trade.

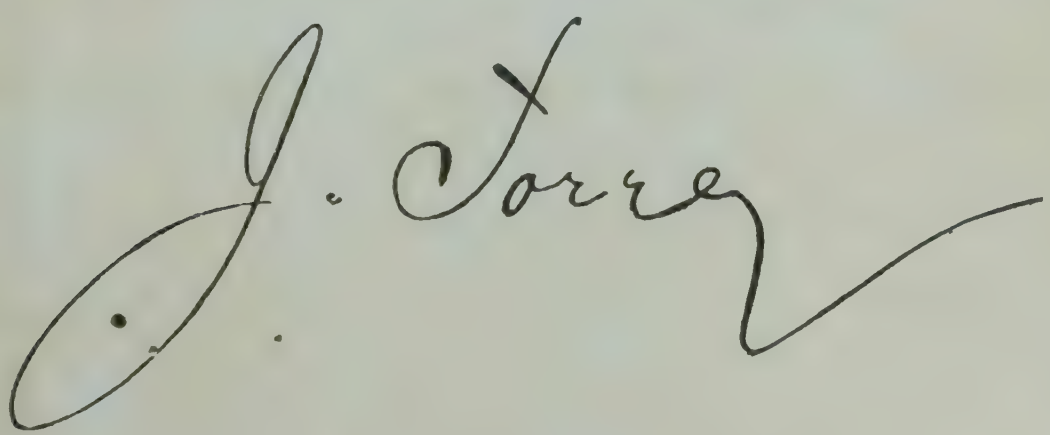
2. Fillers, that is to say, mineral powders which serve to reduce cost to a point where the article is saleable.

3. Substances which make vulcanisation take place more promptly and definitely. Some of them increase the strength and resilience very notably.

4. Tar, asphalt, certain oils, and so-called "rubber substitutes" used in very small proportions. These, when kept within reasonable limits, are, to say the least, unobjectionable in medium and low-priced goods, and some of them have perceptible beneficial effect.

In the long run, "compounding" is not only defensible, but essential to an intelligent and legitimate application of rubber in the arts

Within the last few years, many highly-trained chemists, some in University laboratories and some in the factories, have begun to busy themselves with the accumulated problems of this fifty-year-old industry ; and we have the testimony of all past technological history to assure us that there is no better guarantee for its future.



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Introduction to the Section dealing with Manufactured India Rubber.

BY

DR. WERNER ESCH.

(*Translated from the German by Dr. D. Spence*).

THE preparation of articles from india rubber dates back to before the time of the discovery of vulcanisation, although it was only by the discovery of this process that the india rubber industry has developed to the position which it holds amongst the industries of the present day. It is a remarkable fact, however, that at the present day almost the same methods of vulcanisation are adopted as were first introduced by the discoverers Goodyear, Hancock and Parkes. Even in the details of vulcanisation we still adhere to the old methods, at least to a great extent. In cold vulcanisation we still employ the same solvent for the sulphur chloride, and in the manufacture of india rubber shoes the old capacious heating chambers for vulcanisation are still almost universally employed, although it is true that numerous machines and contrivances of an ingenious character have been constructed and patented from time to time in connection with the formation and the vulcanisation of india rubber articles. For the manufacture of hard india rubber goods we still adhere to the old process of L. Otto Meyer, of Hamburg, which has been in existence since 1854. Yet how great, on the other hand, are the advancements which the industry has made.

It is true, of course, that excellent products were manufactured from india rubber 50 to 60 years ago, but how favourable were the existing conditions at that time? There was relatively very little competition in the field, to reduce the price of the finished articles. The chief raw material then in use was the Para rubber, which could be had in first-rate quality at a comparatively low price. And Para rubber is relatively easy to work with and to prepare for manufacture, for it can stand a fair amount of bad treatment before it is necessary for the unskilled manipulator to attach any blame to its deteriorating tendencies. It required, further, no great skill to prepare satisfactory india rubber goods from the mixings then universally employed. These were relatively rich in india rubber, and, therefore, easily treated. How different is the position of affairs in the rubber industry to-day!

To-day, Para rubber has had to be abandoned as far as the manufacture of a considerable part of our india rubber goods is concerned, and its place has been taken by cheaper rubbers. We have had to learn to renounce to a great extent the easy workable Para rubber, and to condescend to take up the wearisome study of the methods of treatment of "Guayule." Many have been unsuccessful herein on account of inability to fit themselves into the new conditions and surroundings. We must, nowadays, help ourselves out on all hands by means of the cheaper African rubbers if we are not to remain quite in the rear of the india rubber industry. As yet, the new plantation rubber has not succeeded in alleviating the difficulties which the scarceness in Para rubber has gradually brought about. Nor will the old conditions in the rubber industry ever be restored. One can no longer afford to waste india rubber. One has to study rather how much rubber will be necessary in order to obtain a certain prescribed result; and in order to secure this desired result one employs in practice expensive heating chambers, accurate breaking and stretching machines, which depend partly on pressure and partly on vacuum arrangements, self-regulating temperature gauges, and numerous other such contrivances. Electrical and optical examinations have to be made, and laboratory experimental work of all kinds taking up much time has to be undertaken before one can be quite sure in regard to the product which one wishes to put on the market.

One no longer regards the old rule as the soundest wisdom, that the greater the amount of rubber present the better the goods are. We have learned, indeed, that to prepare certain goods from pure rubber is impracticable. Those inorganic and organic substances which formerly were looked upon as filling and cheapening materials only, are now valued as they should be, for we no longer oversee or under-value their influence, and the absolute necessity for their presence in certain kinds of articles manufactured from india rubber. Dangerous compounding ingredients—such as gypsum, palm oil, etc.—we are learning gradually to discard.

Nowadays, in the rubber industry, the necessary machinery is no longer ordered from the nearest small machine manufacturer, as was once the case; but works are fitted with the most modern and the most practical equipment which the large manufacturers of machinery of this kind can provide. In this direction, also, great advances have been made, for of recent years many new branches of the rubber industry have developed, requiring special appliances and contrivances of peculiar dimensions and construction.

Nor has it happened that the modern improvements in regard to appliances and machinery have been accepted without opposition at first. So, for example, the introduction of the vacuum drier, of the centrifuge, of the rotating vulcanising chamber, and of Frankenberg's machine for cold vulcanisation, was in every case fraught with serious difficulties.

SPENCER BRETT, ESQ.,

(Messrs. Gow, Wilson & Stanton, Ltd.),

Hon. Sec. Conference and Reception Committees.

There are now very few rubber works where every kind of manufactured goods can be seen, as was once the case. In general, a tendency towards specialisation exists, and this tendency develops in the direction where the greatest market or output is found. In this way, works have been formed specially for the manufacture of cables, or for the manufacture of india rubber for erasing purposes, or for cycle and motor tyres, or for tyres for children's perambulators; while others have become associated with the manufacture of india rubber heels and soles for shoes, or with the preparation of india rubber solutions, or of soft and hard goods for chirurgical purposes, or of india rubber rings for air-tight vessels and other purposes; while some firms make a speciality of seamless rubber goods, and others of hemp and flax hosing. A flourishing and well conducted business in the centre of Germany is also known to me, where the manufacture of first-rate red india rubber goods has been made a speciality. In no other country has specialisation been developed as in Germany. In England, for example, where the rubber works are relatively fewer but larger in consequence, a great variety of rubber goods is still manufactured by each firm. It is in Germany, nevertheless, where one still finds rubber works which take up the manufacture of every conceivable form of india rubber goods. In Germany that particular class of rubber manufacture has developed most in which the producer delivers his goods direct to the consumer without the intervention of the middle man.

The India Rubber Exhibition in London will afford numerous opportunities to manufacturers and all interested in india rubber for the collection of useful information. On the one hand, interesting novelties amongst the specimens on exhibit will be found; and on the other hand, the discussions amongst those assembled from near and far will lead to an expression of opinions which will be of service to all alike, and which cannot be found in any book or journal on the subject. One can, therefore, already foretell the far-reaching after-effects which the first European India Rubber Exhibition held in London in September, 1908, is likely to have It is the more desirable that such an Exhibition should be held, and opportunity, therefore, afforded of reviewing the present-day position of the industry as a whole, because of the ever-increasing tendency to specialisation in one branch or another of rubber manufacture. By taking advantage of the opportunities which such an Exhibition affords, we can acquire a much better knowledge of those various closely allied branches of the industry which are more or less foreign to us.

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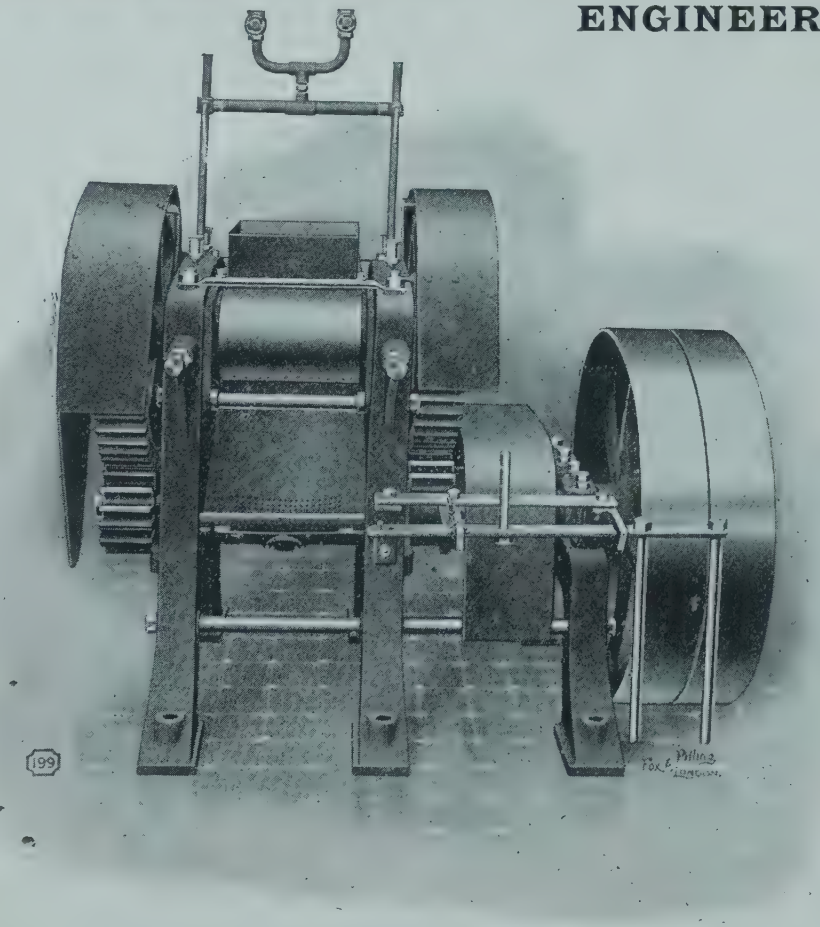

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THE CULTIVATION OF RUBBER.

BY

W. G. FREEMAN, B.Sc., A.R.C.S., F.L.S.

The cultivation of rubber, which is now attracting so much attention in many parts of the tropics, is an industry of quite recent development. We have only to look back some forty years to find that the rubber supplies of the world were procured entirely from plants growing wild in the great forests of tropical America, Africa, and to a very minor degree of Asia, and that the cultivation of rubber had not been seriously attempted. Fears, however, began soon to be entertained that the natural supplies might become exhausted. The collection of the product was often carried on—just as it is to-day in places where proper control cannot be exercised—by reckless and destructive methods, without any thought or care for the morrow.

Accordingly, largely due to the efforts of Sir Clements Markham, the co-operation of the Royal Botanic Gardens, Kew, and the enterprise of the Government of India, steps were taken to secure supplies of the more important of the rubber plants. Mr. H. A. Wickham was commissioned to collect in the Amazon Valley seeds of the Para Rubber tree (*Hevea brasiliensis*). He accomplished his mission successfully, and in 1876 some 2,000 seedlings were sent from Kew to Ceylon, where, as conditions were considered more suitable than India, a special garden was prepared for them at Heneratgoda, in the hot, moist, low country between Colombo and the foot of the central mountain mass. Here some of the original trees, the parents of the flourishing rubber industry of the East, are still thriving. In Ceylon plants were propagated, first by cuttings and, later, by seed, and have been distributed to almost all British tropical possessions and other countries as well. The foresight of the scientific men referred to, and the expenditure by the Indian Government of some £1500 thus resulted in securing the foundation of an industry in which large sums of money are now invested, yielding often very remunerative returns, and in giving the British colonies in the East a clear lead in the establishment of an industry of essential importance in providing the requirements of modern life.

Similar action resulted in obtaining from tropical America supplies of the Central American Rubber (*Castilloa elastica*) and the Ceara rubber (*Manihot Glaziovii*), and from Africa of the rubber vines (*Landolphia*), and, more recently, the Lagos silk rubber tree (*Funtumia elastica*), so that now, whatever happens in their native countries, a supply of the chief rubber plants is secure.

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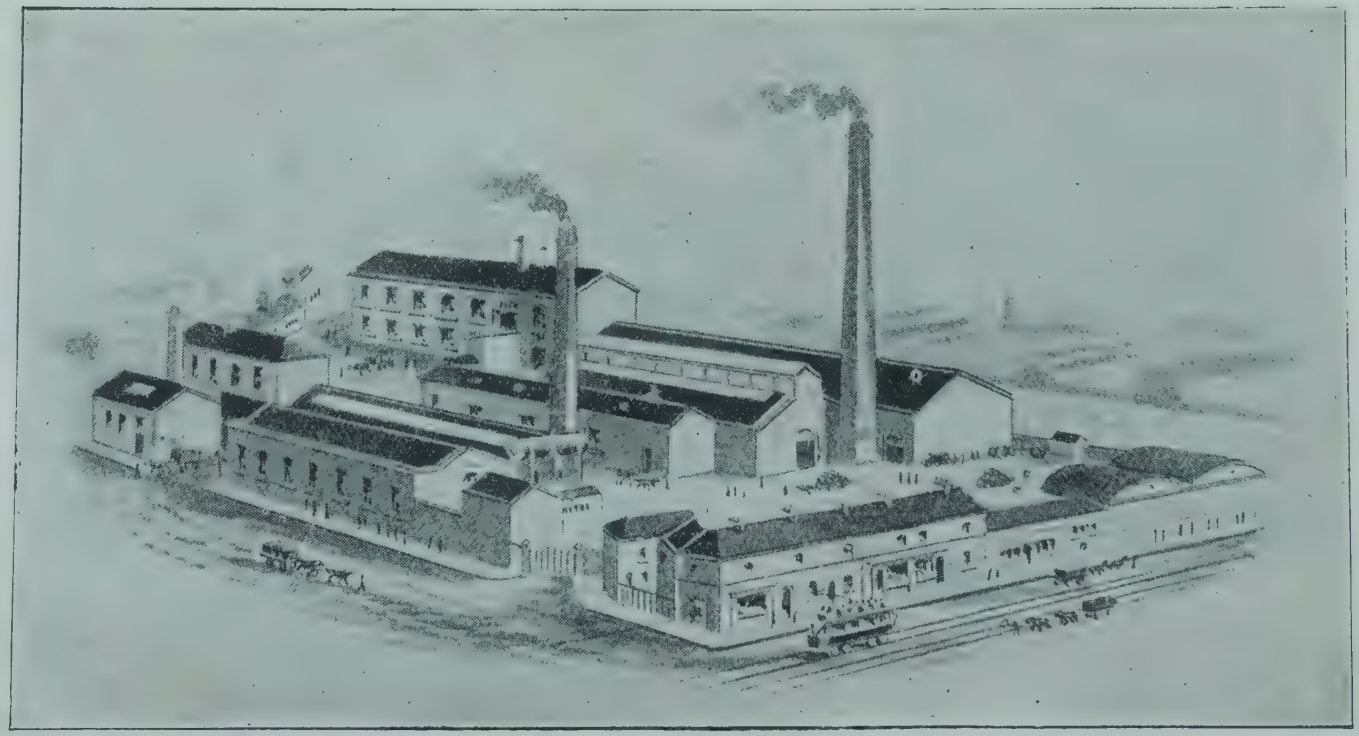

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Much more has been accomplished than the introduction and distribution of these plants. At the Ceylon Botanic Gardens careful experimental work, particularly by Dr. J. C. Willis, the director, and Mr. J. Parkin, led to the discovery of the important phenomenon known as "wound response" in Para rubber, which results in larger yields being obtained from successive tappings, and had much to do with putting rubber cultivation in the position of a remunerative industry. In fact, the rubber industry in the East illustrates very strikingly the practical value of maintaining scientific departments in our Colonies and at home. All the progress has not, of course, been achieved by the Government departments. The independent work of planters and manufacturers has also done a great deal in improving modes of tapping and preparation, but the early experimental work, which might have proved an entire failure, was comparatively costly, and could not well have been done by private individuals; in this instance it was entirely successful, and has much more than repaid the money spent upon it.

In spite, however, of the rapidly-growing importance of the cultivation of rubber, plantation rubber as yet forms only a very small portion of the world's output. Close upon two-thirds of the world's supply of rubber, which in 1907 amounted to 69,000 tons, still comes from the wild trees of tropical America, Brazil alone yielding about half the total. Tropical Africa contributes about one-third, and all Asia, including both wild and plantation rubber, only some 3 per cent.

For the present, then, as in the past, the civilized world is dependent, to a degree without comparison in hardly any other product of equal importance, to the wild supplies. Planting has, however, gone ahead very rapidly recently, and within a few years the supply of plantation rubber will be much increased, and we can look forward to plantation rubber becoming of much greater comparative importance in the near future.

As indicating how rapidly plantation rubber is increasing in importance, it may be noted that, whereas in 1905 some 150 tons were all that were received in London, 500 tons came in 1906, and in 1907 the import amounted to no less than 1,100 tons, *i.e.*, it had increased sevenfold in the space of three years. In addition to the very extensive plantings which have taken place in Ceylon and British Malaya, and India, there are very large areas under rubber in the Dutch East Indies and Borneo. On the other side of the world, planters in Mexico, Nicaragua, Columbia, Ecuador, Peru, and Honduras have put extensive tracts under rubber, and on a smaller scale the West Indies have also their rubber plantations. Planting is also going on actively in Africa throughout many parts of the tropical belt.

This Exhibition will afford for the first time an opportunity of seeing gathered together representative collections from all the chief rubber-growing areas of the world.

W. J. Freeman

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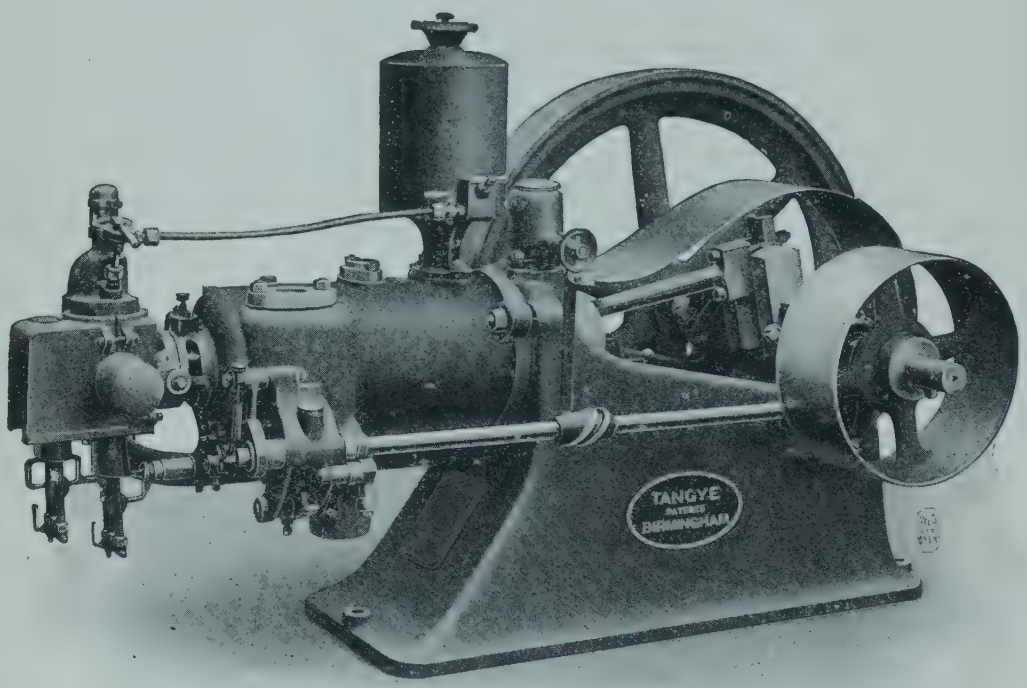

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UNIVERSAL VALUE OF VULCANIZATION.

How it has Developed Trade and Benefited the Public.

BY

WILLIAM FROST.

It may be stated, without fear of contradiction, that vulcanization has been responsible for the creation and development of the rubber industry as it to-day exists, and for the exploitation of numerous articles, goods and commodities which would otherwise never have been marketed for the public benefit. Rubber in its crude state is something diametrically opposite to rubber in its refined condition. Tapped from the rubber tree, Caoutchouc or liquid rubber is, in its crude condition, absolutely worthless without going through various refining and disintegrating processes; and, furthermore, after its transition to a condition of unalloyed refinement, it is, even then, useless for transformation into various marketable goods and articles without the aid of vulcanization in some form or other. There are at the present time many people who do not understand the paramount importance of vulcanization or fully grasp its true import. To afford the reader a clear and appreciative view of the process of vulcanization, it may be aptly compared with the tempering process in connection with metals. Without this process of hardening, many metals would be useless, and the process of tempering has exerted the same important influence on the metal trades as vulcanization on the rubber trade and industries closely allied thereto. Without the aid of vulcanization, the use of rubber would be restricted to a very narrow area of application, and its adaptation to the numerous articles that we now enjoy would be an utter impossibility. Of course, in the manufacture of various "rubber" goods adulterants are sometimes freely introduced; but whatever the process of adulteration or alteration may be, the fact remains that the articles are absolutely dependable on vulcanization for their production, its usefulness and utility being made use of in the manufacture of all forms of rubber goods in use at the present day; So broad, indeed, is the application of rubber, that its partial infusion into articles not exclusively of all-rubber manufacture is frequent, although perhaps not widely known and generally appreciated, for without some infusion of rubber into many goods and articles manufactured at

the present day, they would lack the flexibility, life, and durability which are now their outstanding characteristics, and which are responsible for their continued sale. The importance of vulcanization is demonstrated on all sides, but in one direction more particularly its supreme usefulness is most manifestly and markedly emphasized. We have only to take a cursory glance at the big industry that has been created and developed so enormously in connection with the repair of motor-car tyres. This new industry alone has been the means of educating a large section of the public up to the value and importance of vulcanization. It is irrefutable that without the aid of vulcanization in its present advanced and highly efficient form, the question of motor tyre cost would be so material as to deter large numbers of people from enjoying the comparatively new sport and pastime which through the aid of vulcanization is now made economically possible. Vulcanization alone has created many entirely new branches of trade, but perhaps the most conspicuous example of its commerce-creating characteristics is to be found in the motor tyre repairs business at the present day. It can be conscientiously claimed that the present scientific, yet simple, highly efficient, and permanently successful process of vulcanization has resulted in the utilisation of capital to much advantage, to the employment of large numbers of people, to the creation of many branch-businesses throughout this kingdom and abroad; and, finally, to the lasting benefit of the public. Visitors to this Exhibition will be greatly impressed by the enormous extent to which rubber is employed for the manufacture of various goods in use at the present time, and they will also appreciate this fact, that although the rubber industry, as a whole, is of enormous dimensions, its progress was practically the result of vulcanization; and the present Exhibition seems to foreshadow a still further marked increase in the industry as a whole, as the result of the employment or rubber in a good many directions where it is at present unknown. I need hardly say that I regard the subject as one of genuine interest, and which every person, however remotely connected with rubber, should make an effort to thoroughly understand.

A. STAINES MANDERS, J.P.,

Organising Manager,

International Rubber and Allied

Trades' Exhibition, 1908.

LOAN SECTION.

A Selection of Herbarium and Museum Specimens and Figures and living Plants illustrative of the principal Genera yielding Rubber of Commercial Importance.

Exhibited by the Director of the Royal Botanic Gardens, Kew.

1.—**Willughbeia firma,** Bl. (*Apocynaceæ*). Malay Archipelago. "Getah Singgarip," "Getah Gerip." Herbarium specimen. Figure. Stem and Rubber from Perak. Rubber from Pulau Jerajah, near Penang. Fruits from Singapore.

2.—**Clitandra Henriquesiana,** K. Schum. (*Apocynaceæ*). South Central tropical Africa. "Root Rubber." Herbarium specimen. Rubber from Kabompo River, N.W. Rhodesia. "Blanket of the Vine," second stage in the collection of the Rubber from S.E. of Mumbeza River, N.W. Rhodesia. Bark removed from stem by hammering.

3.—**Landolphia Thollonii,** Dewevre (*Apocynaceæ*). Southern Congo. Herbarium specimen. Piece of Rhizome and Rubber.

4.—**Landolphia owariensis,** Beauv. (*Apocynaceæ*). West tropical Africa. "White Rubber Vine." Herbarium specimen. Figure. Stem from Accra. Fruits from Benin City. Rubber from eight-year old vines; Sierra Leone.

5.—**Landolphia Kirkii,** Dyer (*Apocynaceæ*). East tropical Africa. Herbarium specimen. Figure. Stem and Fruits from Zanzibar. Rubber from Natal.

6.—**Landolphia Buchananii,** Stapf. (*Apocynaceæ*). East tropical Africa. Herbarium specimen. Stem from the virgin forest, Masuka Mountains.

7.—**Funtumia elastica,** Stapf. (*Apocynaceæ*). Tropical Africa. "Ire or Lagos Rubber." Herbarium specimen. Figure. Fruits and Seeds. Rubber. Photograph of trees in Botanic Garden, Trinidad. Portion of trunk showing the detrimental method of tapping the trees practised by natives.

8.—**Raphionacme utilis,** Brown and Stapf. (*Asclepiadaceæ*). South Angola. "Ecanda" or "Bitinga." Figure. Tubers. Rubber extracted in the laboratory at Kew.

9.—**Urceola elastica,** Roxb. (*Apocynaceæ*). Malaya. "Getah Gerip Gerip Tambaga." Herbarium specimen. Fruits and Seeds.

10.—**Urceola esculenta,** Benth. (*Apocynaceæ*). Malaya. "Kyetpanug." Specimen. Unripe Fruits. Rubber.

11.—**Hymenoxys sp.** (*Compositæ*). Colorado, North America. "Colorado Rubber." Plant and Rubber.

12.—**Parthenium argentatum,** A. Gray (*Compositæ*). Central America. "Guayule." Rubber. Plant and Rubber.

13.—**Hevea brasiliensis,** Muell. Arg. (*Euphorbiaceæ*). Brazil. "Para Rubber." Herbarium specimen. Figure. Rubber from various sources and of various preparations. Fruits, including one 5-lobed, and Seeds.

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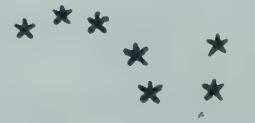
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LOAN SECTION.

14.—**Manihot dichotoma,** Ule. (*Euphorbiaceæ*). Brazil. "Jequié Rubber." Herbarium specimens and Figures. Rubber and Seeds.

15.—**Manihot Glaziovii,** Muell. Arg. (*Euphorbiaceæ*). Brazil. "Ceara Rubber." Herbarium specimen. Rubber from various sources. Bark, Roots, Seeds, etc.

16.—**Sapium Jenmani,** Hemsl. (*Euphorbiaceæ*). British Guiana. "Touck-pong Rubber." Herbarium specimens. Figure. Rubber.

17.—**Sapium verum,** Hemsl. (*Euphorbiaceæ*). Colombia. "Virgin Caucho." Herbarium specimens. Figure. Rubber. Seeds.

18.—**Sapium utile,** Ule. (*Euphorbiaceæ*). Ecuador, Peru. "Palo de leche." Figure.

19.—**Ficus elastica,** Roxb. (*Moraceæ*). Indo-Malaya. "Getah Rambong." Herbarium specimens. Figure. Photograph of Trees. Rubber from various sources.

20.—**Castilloa elastica,** Cerv. (*Moraceæ*). Western tropical America. "Central American Rubber." Herbarium specimens. Figure and Photograph. Rubber from various sources. Seeds.

21.—**Photographs of Castilloa and Hevea,** seven years old. Botanic Garden, Trinidad. Photograph of Rubber Nurseries, Trinidad.

22.—**Group of young living Plants of Hevea brasiliensis,** Muell. Arg.

A Rubber Tree. This has been grown from a seed within three years in a hot-house in London by John McEwan, Esq., Director Batu Caves Rubber Co., Ltd., 10–11, Lime Street, London, E.C. The tree is 5 ft. 6 in. high, and will be tapped during the Exhibition.

Photographs representing the Rubber Growth at various stages, with Bungalows and Factory. Kindly lent by Messrs. McMeekin & Co., 10–11, Lime Street, London, E.C.

A series of Pictures showing different systems of Tapping and Factory Work in their earlier stages. Kindly lent by Francis J. Holloway, Esq., of Ceylon.

Photos showing the growth of the Rubber trees at various ages. Kindly lent by E. G. Windle, Esq., Southern India.

McMeekin & Co., 10 & 11, Lime Street, E.C.

Three large frames, each containing four photographs, representing the Rubber growth at various stages, with Bungalows and Factory.

Rubber and other Economic Plants, kindly lent by R. Hoffmann, Esq., Tower House, Streatham.

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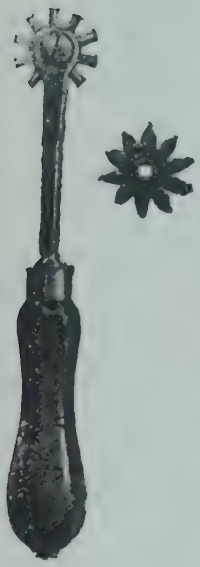

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CEYLON SECTION.

(For Commissioners and Committee see front pages of this Catalogue.)

IF to India belongs the credit, in the first instance, of the collection and transmission of Rubber seeds and plants from their native forests in South America, the whole cost of which operations were borne by her Government, Ceylon can claim to have been the nursery of Rubber in the East.

More than thirty years have passed since the first Rubber seeds were brought to her shores.

At that time the trade in Rubber was in its infancy, demand was limited, the supplies from South America were ample to meet all requirements, and prices were moderate.

It was more, then, as a scientific experiment, than with any view to immediate planting enterprise, that, in 1875, Mr. Wickham collected some 70,000 seeds in the forests of South America. These seeds were taken to Kew, and of seedlings there raised from them some 20,000 were in the following year sent to Peradeniya Gardens, near Kandy, the Hill Capital of Ceylon. Travelling in Wardian cases, they arrived in excellent condition, so much so, that in 1877 cuttings from the one-year-old trees were sent from Peradeniya to India and the Straits Settlements. At the same time a beginning of the cultivation was made in the low country at the Government Gardens at Heneratgoda, where the plants found a more congenial habitat than at Peradeniya. Seeds were there produced in small quantities as early as 1882, while it was not till 1884 that the first few seeds were borne by the older trees at Peradeniya.

In the last-named year fully 1,000 seedlings were distributed from Heneratgoda to various parts of the island. In subsequent years, as the supply of seeds has increased, these have been sent to all parts of the tropics in ever-increasing quantities. Consignments have been made to such widely separated countries as Java, Borneo and Sumatra in the East, Queensland and Fiji in the South, German East Africa and the Gold Coast, Seychelles and the West Indies.

It is only within the last twelve years that the constant increasing demand for manufactured Rubber gave signs of outstripping the capabilities of supply from South America, and prices began to show a marked upward tendency. The movement, once begun, developed rapidly, till, in 1904, Para Rubber was quoted at 6s. per lb., fully double the price of ten years earlier.

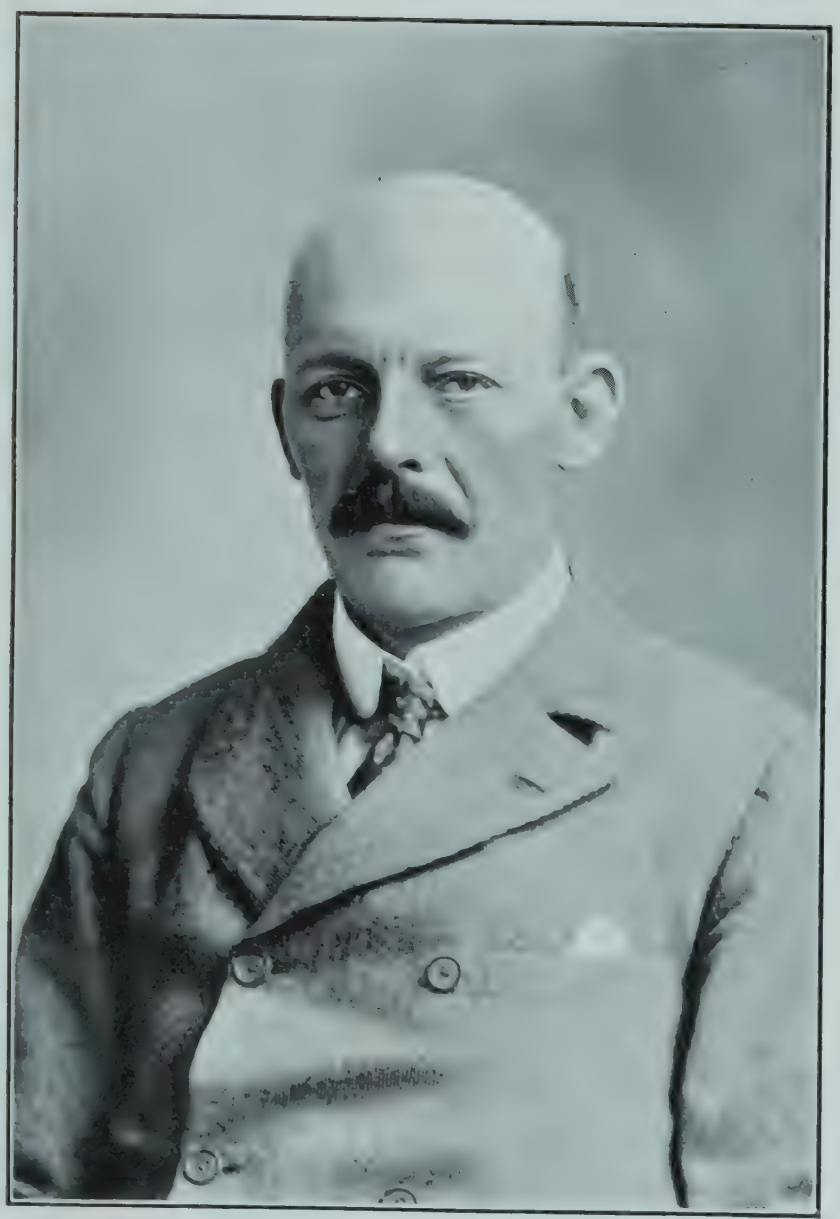
CEYLON SECTION.

It may seem strange that, seeing that the years immediately following the introduction of Rubber into the island witnessed the complete downfall of coffee, so little attempt was made to have recourse to Rubber as in some degree a substitute for the former staple. But it was then thought that Rubber trees would give no return for ten years, and planters preferred to turn for help first to Cinchona and then to tea, both of which had already been grown with satisfactory results. The wonderful success achieved in tea-growing continued for many years to absorb the attention of planters, and it was not till the beginning of the present century that Rubber planting on a large scale was taken in hand. How rapid has been the subsequent progress is shown by the following figures: In 1900 the area in Ceylon under Rubber was less than 2,000 acres; in 1904 it was little over 10,000 acres; to-day it is returned as 180,000 acres!

The figures are of such magnitude as to render the problem of the future of the Rubber market one of the deepest interest for Ceylon and her people; and, accordingly, attempts have been made to forecast the probable course of events. But the elements in the problem are subject to so many complex influences, that it is doubtful if any reliable solution is at present attainable.

It is certain that, unless there be some unexpected failure in the cultivation of the tree, the weight of Rubber produced by the vast areas now planted in Ceylon, the Malay Federated States, and other tropical countries will a few years hence be very large. On the other hand, it is reasonable to look for a yearly increase in demand, though the events of the last few months make it doubtful if the rate of increase of late years can be safely taken as the measure of the rate in years to come; and it would be rash, therefore, to assume that the increment of demand will be sufficient to absorb the increasing cultivated supplies. There remains the factor of wild Rubber, which now practically holds the market, but of whose power to retain its position in the face of the coming competition it is difficult to form an opinion. But, as in the past the yearly average price for Para Rubber has been as low as 2s. 6d. without check in the supplies, it would seem probable that, when the time of conflict comes, the price may fall below that figure, and those engaged in Rubber planting will do well, therefore, to exercise caution, especially in respect of further extension of area under cultivation.

(*Contributed.*)



ALFRED BROWN, ESQ.,

President

Ceylon Association, London.

Awarded Gold, Silver, Commemorative, and other Medals, Diplomas, Merits, and Certificates at various International Exhibitions, including St. Louis, 1904.

Awarded Bronze Medal with Diploma for Para and Castilloa Rubbers at St. Louis Exhibition, 1904.

SPECIAL NOTICE

— TO THE —

RUBBER PLANTING WORLD.

PARA, CASTILLOA, CEARA, &c.

Seeds and Stumps forwarded to all parts of the World.

A Government order by wire, Kartoum *via* Cairo (Egypt), 7th March, 1908 :—" Send 300,000 Ceara seed ; 10,000 ditto stumps ; 100,000 Hevea seed, 10,000 ditto stumps ; Castilloa 5,000 seed."

An Agricultural Department order from Dutch West Indies, Paramaribo, 18th January, 1908 :—" Please send me as soon as you have fresh seed 90,000 (ninety thousand) seeds of *Hevea Brasiliensis*. Your method of packing is alright, the seeds shipped last year to the Superintendent of the Botanic Garden arrived in good condition."

A Planting Company's order by Telegraph (for Cameroon), Berlin, 7th March, 1908 :—" Please send 50,000 Hevea stumps, arrival in May, Hamburgh Weerman Line. The purchase money to be paid on signing and in exchange for documents Hongkong and Shanghai Banking Corporation, please confirm order."

A Surinam Planter's order who purchased 20,000 Hevea seeds last year, 17th February, 1908 :—" I now order from you 20,000 Hevea seeds to be sent by parcel post packed as before. Please send selected seed from mature trees ; the best result we got are from your seeds packed as above and sent by parcel post."

Mauritius.—The Manager of a Mauritius Estates Co. having many Estates under its control who suffered considerable loss in purchasing Ceylon Hevea seeds from others, writes 5th May, 1908 :—

" I have no desire of repeating the experiment ; I turn to you to supply me with seed (Para) that will give better results than those I have related.

" As the first Para seed will soon be on the market, I would ask you to let me know—by the first steamer leaving Colombo for Mauritius—whether you would be prepared to supply us with the Para seeds we require, guaranteeing a certain percentage of germination. Quantity required about 250,000 seeds.

" When writing please give your Bankers, the Code you will use if cabling becomes necessary, and any details you may deem necessary for a speedy transaction of the business in view.

" A price list of the various kind of seed you supply to tropical countries would greatly oblige."

Hevea Seeds and Stumps.—In sending an order for Hevea seeds and stumps a proprietor of extensive estates in German West Africa writes, dating Hamburg, 10th April, 1908 :—

" From Dr. —— and Dr. ——, also Berlin, I have been informed that you are in a position to deliver seeds and stumps of the Hevea Brasiliensis in such a way that they arrive here fresh and the loss not to exceed over 10 per cent."

The *India Rubber Journal* of 19th November, 1906, quotes from the *Tropenpflanzer*, touching one of our Para stump shipments :—" The writer saw 100,000 of these stumps which had just been planted out, none were dead, and many were putting out new roots. The Ceylon consignors, J. P. William & Bros., Henaratgoda, guarantee a mortality not exceeding 25 per cent., and the Manager of the Upola Company estimated the loss on this batch at 2 per cent. only. This is decidedly the best method of transporting Heveas."

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South Africa, the great authority on South African affairs, of 25th March, 1889, says :—" An interesting Catalogue reaches us from the East. It is issued by WILLIAM BROTHERS, Tropical Seed Merchants of Henaratgoda, Ceylon, and schedules all the useful and beautiful plants which will thrive in tropical and semi-tropical regions. We fancy Messrs. Williams should do good business, for now that the great Powers have grabbed all the waste places of the earth, they must turn to and prove that they were worth the grabbing. We recommend the great Powers and Concessionaries under them to go to William Bros."

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The Michie-Golledge Patent Coagulating Machine received **Gold Medal** at the **Rubber Exhibition** held in Ceylon in September, 1906. Price, delivered in London, **£45.** Full particulars on application.

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NORMAN GRIEVE, ESQ.,

Ex-President

Ceylon Association, London.

Ex-President

International Rubber Exhibition.

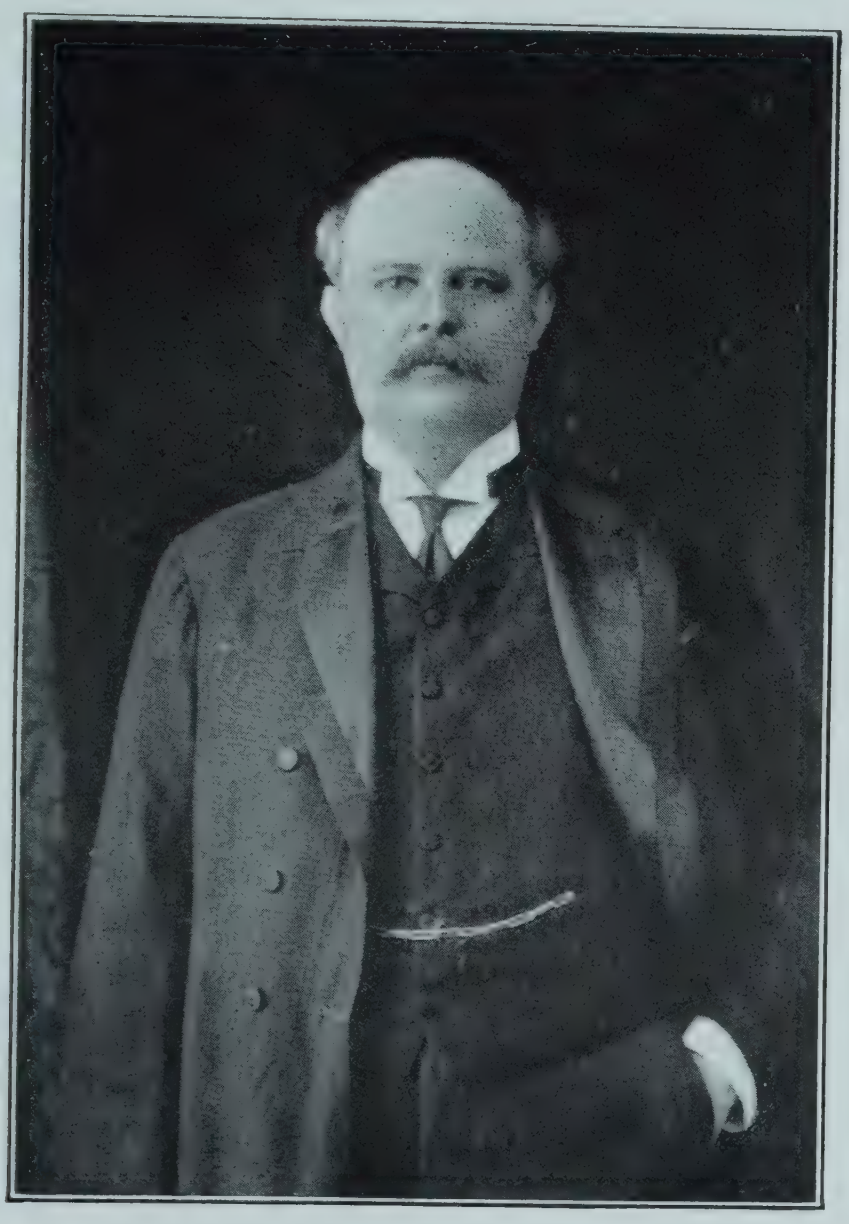
Exhibit No. 2.

CEYLON.

No. of Exhibit.	District or Exhibitor.	Estate or Company.	Description.
1			Amber Biscuits.
2			Dark „
3			Sheet
4			Amber Crepe.
5		Arapolakande.	Fine „
6		Culloden.	Thick „
7		Gikiyanakande	Pressed „
8	**Kalutura.**	Halwatura.	Block „
9		Vogan.	Scrap „
10		Pantiya.	Block Scrap Crepe
11			Crepe from Shavings
12			Worms.
13			Block Worms.
14			Block Shred.
15			Scrap.
16		Perth.	Para Biscuits.
17	**Kalutura.**	P. P. K.	Rubber Biscuits.
18			Finest pale thick Crepe
19		Putupaula.	Finest pale thin Crepe
20	**Kalutura.**	Vogan Tea Co.	Photographs.
21	**Kalutura.**	Culloden.	Latex.
22	**Kalutura.**	Arapolakande.	Rubber Soil.
23	**Kandy Districts.**	Katugastota.	Para Sheet.
24			„ Crepe.
25		Pallekelly.	Ceara Rubber Sheet.
26		Kondesalle.	Para Sheet.
27	**Passara.**	Kumaradola.	Para Biscuits.
28			Para Scrap.
29	**Kurunegalla and Galage-**	Udapolla.	Para Biscuits.
30	**dera.**	Deaella.	„ „
31	**Rangala.**	Duckwari.	Show case containing :
32			Extra fine white biscuits
33			Do. pale do.
34			Do. dark do.
35			Four year old Biscuits.
36	**Galle Districts**	Dolahena.	Para Rubber.
37		Devitura.	Para Sheet.
38		Nakiadeniya.	Commercial Para Sheet.
39	**Sabaragamuw.**	Mahawala.	Para Rubber Sheet.
40		Hapugastenne.	Rubber Seed Oil.
41	**Kegalle.**	Waharaka.	Para Biscuits.
42	**E. F. Van Dort.**		Apparatus for testing the elasticity of Rubber.
43	**M. Kelway Bamber.**		Model of Rubber factory
44	„		Rubber soils.
45	**Plate and Co.,** Colombo	Plâté and Co.	Photographs.
46	**Matale.**	Wariapolla.	Para Biscuits.
47	„	Keppitigalla.	Para Scrap. „ Block. „ Worms. „ Sheets. „ Biscuits. „ Lace.

CEYLON.

No. of Exhibit.	District or Exhibitor.	Estate or Company.	Description.
48	**Matale.**	Suduganga.	Commercial Para Sheets
49	,,	Nikakotua.	Vacuum dried thick Crepe.
50	,,	,,	Fine pale Crepe.
51	,,	Ballacadua.	Fine pale Crepe.
52	,,	Syston.	Para Biscuits.
53	,,	Dangan.	,, ,,
54	,,	Suduganga.	Section of Rubber tree showing tapping and renewal of bark.
55	,,	Ambangonga	Soil.
56	,,	Bandarapola.	Soil.
57	**Kelani Valley.**	Polatagama.	Crepe Rubber.
58	,,	Grand Central.	Block Rubber Sheets.
59	,,	,,	Crepe Rubber.
60	,,	Walpola.	Para Biscuits
61	,,	Hanwella.	Para Rubber Sheets.
62	,,	We Oya.	Para Biscuits.
63	**Lower Dickoya.**	Aberdeen.	Para Biscuits.
64	**Royal Botanic Gardens,**		Ceara Rubber tree.
65	Ceylon.		Para Rubber log, 6 ft.
66			,, ,, 6 ft.
67			,, ,, 6 ft.
68			,, ,, 6 ft.
69			,, ,, 6 ft.
70			,, ,, 6 ft.
71			,, ,, 6 ft.
72			,, ,, 6 ft.
73			,, ,, 6 ft.
74			,, ,, 6 ft.
75			,, ,, 6 ft.
76			,, ,, 6 ft.
77			,, ,, 6 ft.
78			,, ,, 6 ft.
79	**Royal Botanic Gardens,**		Rubber Seed.
80	Ceylon.		Oil and Cake.
81		Wardian Case.	Para Rubber Seeds, showing methods of packing for long distance transport.
82		,,	Para Rubber plants, 1 year old, from seed.
83		,,	Ceara Rubber Plants.
84		,,	Chillie plants (catch crop).
85		,,	Cotton plants (catch crop).
86		,,	Lemon grass (catch crop).
87		,,	Dadap plants, shade tree and green manure.
88		,,	Para Rubber tree.
89		,,	,, ,,
90		,,	,, ,,
91	**Royal Botanic Gardens,** Ceylon.		Tapping knives. 1, No. 2 knife, 2, Simplex 1, sharp pointed pricker. 1, blunt ditto.



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Commissioner from Ceylon to the
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Estate Engineering of every Description undertaken.

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Talawakelle, CEYLON.

No. of Exhibit.	District or Exhibitor.	Estate or Company.	Description.

Note on Nos. 88, 89, 90.—Three young Rubber trees from New Peradeniya Estate, Ceylon; elevation 1,500 feet. The soil level is indicated by the removal of a narrow ring of bark. No. 1 circ. : 2 years old, growing in alluvial soil by river bank about 15 feet above mean water level. No 2 circ. : 3 years old, growing in pocket of stony soil enclosed by slab rocks on hill side. No. 3 circ. : 2 years old, growing wedged among rotten rocks by side of stream, 4 feet above water level.

92	**Planters' Association of Ceylon.**		Series of panel views, illustrating Rubber cultivation.
93	**Kalutara Bamber;**	Elkande	Soil.
94	**Kandy Districts.**	Katugastota.	Para Rubber Biscuits, 10 lbs.
95	**Royal Botanic Gardens.**	In Wardian Case.	Castilloa Rubber plants.
96		,,	Crotalaria striata plants (green manure).
97	,, ,,	,,	Ground-nut plants (catch crop and green manure).
98	**Kalutara.**	Gikiyanakande	Screen of Photos.
99	**Surveyor General.**		2,000 copies of map of Ceylon, shewing Rubber cultivation.
100	,,		A 4-mile map of Ceylon, shewing the approximate position of Rubber cultivation.
101	**Kalutara Co.**	Glanrhos.	Rubber, 20 lbs.
102	**Kalutara Co.**	Gikiyanakande	Rubber, 20 lbs.
103	**Secretary, Joint Planters' Assoc. and Chamber of Commerce Rubber Committee.**		2 Ash Pumpkins.
104			,, ,,
105			2 yellow Pumpkins.
106			,, ,,
107			4 Pumbilos. 7 wild Pines.
108			Arecanuts and Kitool Flower.

Bowman Northway. Patent Tapping Knives.
See Commercial Section, Exhibit No. 100.

Alexander David Callander. Tapping Knives.
See Commercial Section, Exhibit No. 52.

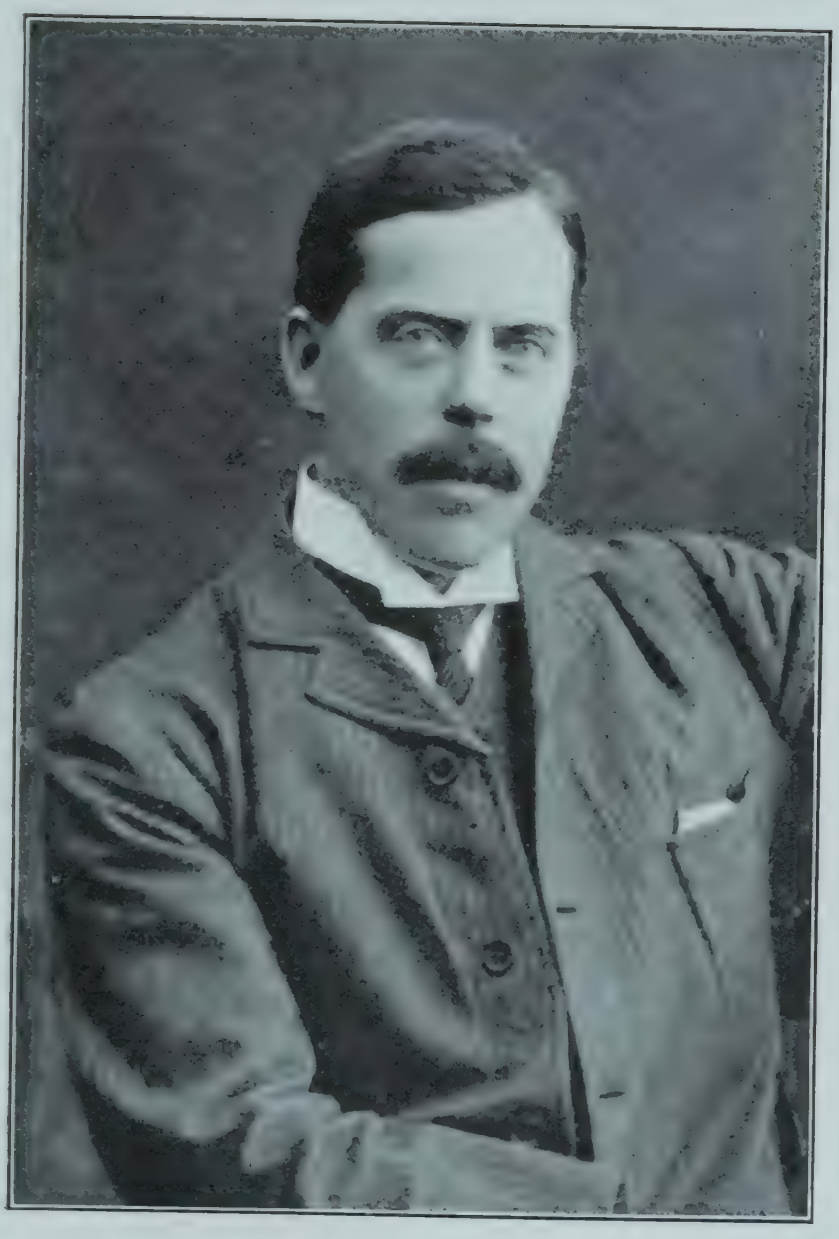
Capper & Sons, "Times of Ceylon," Colombo.
See Commercial Section, Exhibit No. 137.

"Ceylon Observer," Colombo.
See Commercial Section, Exhibit No. 1.

Rosehaugh Tea & Rubber Co., Ltd., Kalutara Estates, Ceylon.
See Commercial Section, Exhibit No. 3.

Rubber Plantations, Ltd., Dangan Estate, Ceylon.
See Commercial Section, Exhibit No. 51.

J. P. William & Bro., Tropical Seed and Plant Merchant, Heneratgoda, Ceylon.
See Commercial Section, Exhibit No. 25.



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Special Representative to the Exhibition
from the Government of Ceylon.

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THE TROPICAL AGRICULTURIST & MAGAZINE OF THE CEYLON AGRICULTURAL SOCIETY.—Published monthly and circulating very widely in Ceylon, India, Malaya, Java, Borneo, West & Central Africa, West Indies & Central America, is the leading publication on Tropical Agriculture. It is edited by the Director of the Peradeniya Royal Botanic Gardens, assisted by his Scientific Staff. Tropical Agriculture and Planting Industries in the most comprehensive sense form the subject of discussion and consideration, while special attention is devoted to new products. Several pages each month are filled with information on rubber cultivation, but the variety of the products treated in each number goes to make it the most useful publication the Tropical and sub-tropical Planter can subscribe to. The Annual Subscription is £1.

"HEVEA BRASILIENSIS" or PARA RUBBER.—By Herbert Wright, late Controller of Experiment Station, Ceylon, and now Editor, India-Rubber Journal and Consulting Economic Botanist. This is the standard work on Pará Rubber cultivation and deals with the whole cultivation and preparation of the produce in a most comprehensive manner. The third edition, just published, contains a vast amount of new information and is illustrated with over 90 full page Photographic Plates. It touches upon every point of importance to producers in the tropics. Price 10/-, on Sale at our Stand.

THEOBROMA CACAO or COCOA.—This work by Mr. Herbert Wright, who made a special study of Cacao in Ceylon, is uniform with the above work on rubber. It deals with the whole subject of cultivation, fermenting, washing and curing, improving the yield, and mixed plantations, in an exhaustive manner. The work is freely illustrated with Photographic Plates, and is published at 7/-.

THE SCIENCE OF PARA RUBBER CULTIVATION.—A series of 6 papers dealing with this subject in a practical and up-to-date manner. Fully treats on distance in planting, intercrops, tapping and tapping methods, rubber manuring, and all points in the rubber planting industry. Also Ceara, Castilloa, Funtumia, and other rubbers. By Herbert Wright. Illustrated. Price 3/-.

THE CEYLON RUBBER EXHIBITION, SEPT. 13th—27th, 1906.—A Descriptive account of the first Rubber Exhibition ; full list of the exhibits and awards; notes on the prize exhibits and full reports of all the lectures and demonstrations. Lecture on Rubber and Cotton, Vulcanization, Prevention of Pests and Diseases, Camphor and its Distillation, Tobacco Cultivation, etc. Illustrated. Specially interesting to visitors to the International Rubber Exhibition. Price 4/-.

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Our latest pattern 1908 Rubber Rolling and Washing Machines have met with unqualified approval on the part of planters in the Malay Peninsula.

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FEDERATED MALAY STATES SECTION,

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The Straits Settlements and Federated Malay States Section.

RUBBER CULTIVATION IN THE MALAY PENINSULA.

BY

R. DERRY.

(Co. Commissioner, Straits Settlements and Federated Malay States).

THE Straits Settlements and Federated Malay States, or Malay Peninsula, is an exceptionally well watered country, having an equable rainfall averaging 100 inches per annum, and a humid climate registering a mean temperature of 80° (Farenheit). Unlike most tropical countries, there is no pronounced dry season, the driest months, January and February (the season of rice harvest), seldom pass without some rain, and a drought as understood in India or Burmah never occurs. The soils vary from fairly good loam, to clayey patches, on a laterite formation on the costal regions, with granite mountain chains intersecting the interior ; and although the soils do not exceed average quality, such condition, in combination with innumerable springs and rills which feed large rivers, together with the excessive humid climate, form a wealthy agricultural zone.

Of the effect of this continuous humidity many instances could be cited : *e.g.*, such favourite fruits as the Mangosteen and Durian nowhere attain to so high a state of perfection as in the Malay Peninsula, and the famous tannin and dye-stuff—*Gambier*—has seldom, if ever, been successfully grown outside Malayan regions. Gutta-Percha, too, of several kinds, are indigenous to these regions, and the world's demand of gutta was furnished by the Peninsula for many years. Rambong Rubber, or *Ficus elastica*, is also indigenous of the Malay Peninsula and Sumatra.

Para Rubber (*Hevea braziliensis*) was introduced *via* Ceylon in the year of 1876, and since the year of 1900—when it first received serious general attention—has grown with remarkable vigour, and it is asserted by experts and leading planters that the growth of the tree is nowhere more satisfactory than in the Malay Peninsula. This success, or adaptability, of the tree, will be

apparent if the conditions that obtain in this zone, together with an outline of some of the functions performed by the tree for the production of latex, are briefly considered.

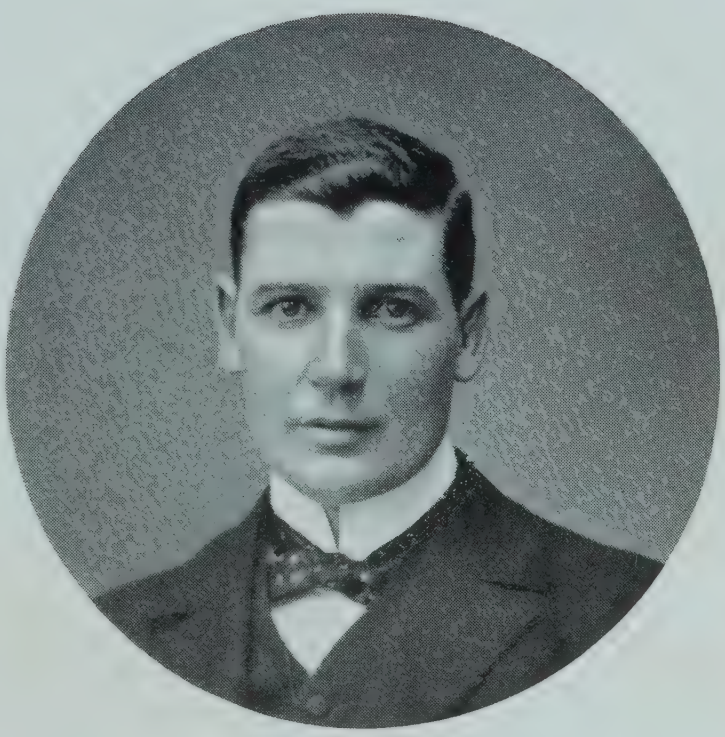
It is an established fact (whether in Brazil or the East) that the best time of the day for tapping is in the early morning before sunrise. The exudation of latex lessens as the sun rises and becomes more powerful. This is due to the abnormal absorbtion of water throughout the night, and the rapid evaporation by the leaves under the influence of sunlight. Thus, a tree measuring exactly three feet in girth at day-break, or six o'clock, may by mid-day measure half an inch less, according to the day, whether bright or rainy. As the evening advances, and the evaporation lessens, the tree gradually recovers its early-morning measurement, and soon after sundown has reached tension point. If, therefore, trees are tapped too late in the mornings, after the tension has dropped (*i.e.*, after evaporation has exhaled some part of the accumulated moisture), the pressure of water on the lactiferous ducts is only partial, or wanting to obtain a good flow of latex.

It should be remarked, however, that evening tappings are quite feasible, provided that the work is deferred until after sundown, and can be carried out with the aid of artificial light.

The yield or abundance of latex depends on the area of bark available for tapping ; and, therefore, the size, not the age, of a tree, represents its value as a crop bearer. As may be expected in very wet tropical countries, the ratio of growth is much more rapid than in drier ones, for the reason that the only resting or dormant season is represented by the leaf-fall, and this may be partial or complete ; but the resting or dormant season is much more pronounced in dry tropical countries, or in countries where the wet season is followed by a period of drought. In the Malay Peninsula, *Hevea braziliensis* is a partially deciduous tree, as it seldom happens that this species entirely defoliates itself there ; but in drier countries it is completely deciduous, and remains in a dormant state (which may be a long period) following climatic conditions, and the increment of growth is in consequence periodical, or less, instead of almost perennial.

Where the climate is favourable, trees should average eighteen to twenty-four inches girth at a yard from the ground, in five years, according to the situation, whether sheltered or exposed (twenty-four inches being the size considered suitable for first tapping), and the subsequent increments of growth should average about three inches per annum. As a matter of fact, a satisfactory increment of growth depends more on climatic conditions than on rich soils.

Although there were stock trees at the Botanic Gardens, and on a few estates in the Colony and Federated Malay States, planting enterprise did not commence until the year of 1900, when the suitability of the country for Rubber cultivation was at last



J. B. CARRUTHERS, ESQ.,

Director of Agriculture and Government Botanist,
Federated Malay States.

Local Secretary and Director to the Federated Malay States and Straits Settlements Government and Planters' Exhibition Committee.

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Berlin

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&c., &c.

realised. At the present time it is estimated that (including the native State of Johore) there are over 260 estates, comprising about 130,000 acres of rubber trees, planted, or ready to plant; or, say, approximately, 26,000,000 trees of varying ages; and supposing the area of rubber cultivation be increased to 200,000 acres, then a large share of the world's demand for raw rubber could be supplied from the Malay Peninsula.

As has been already stated, Rambong Rubber, or *Ficus elastica*, is an indigenous plant found growing on, or near, the mountains. In its wild state it is found on rocks, or other trees; it is then an epiphyte, with a crest of leaves on long rambling ærial roots. Under cultivation, by being treated as a terrestrial plant, its habit is changed, and a trunk, or main stem, and large lateral branches are developed, affording a large area of bark available for tapping, with a corresponding increase in respect of yield of Rubber, as might be expected from the advantage of tapping stems and branches instead of roots.

A pamphlet, written by Mr. J. B. Carruthers, Director of Agriculture, Federated Malay States, giving statistics and details of the cultivation, production, preparation, cost, and a brief review of the industry, can be obtained from the attendant in the Malayan Section of the Exhibition.

Exhibit No. 37.

Governments of Federated Malay States and Straits Settlements.

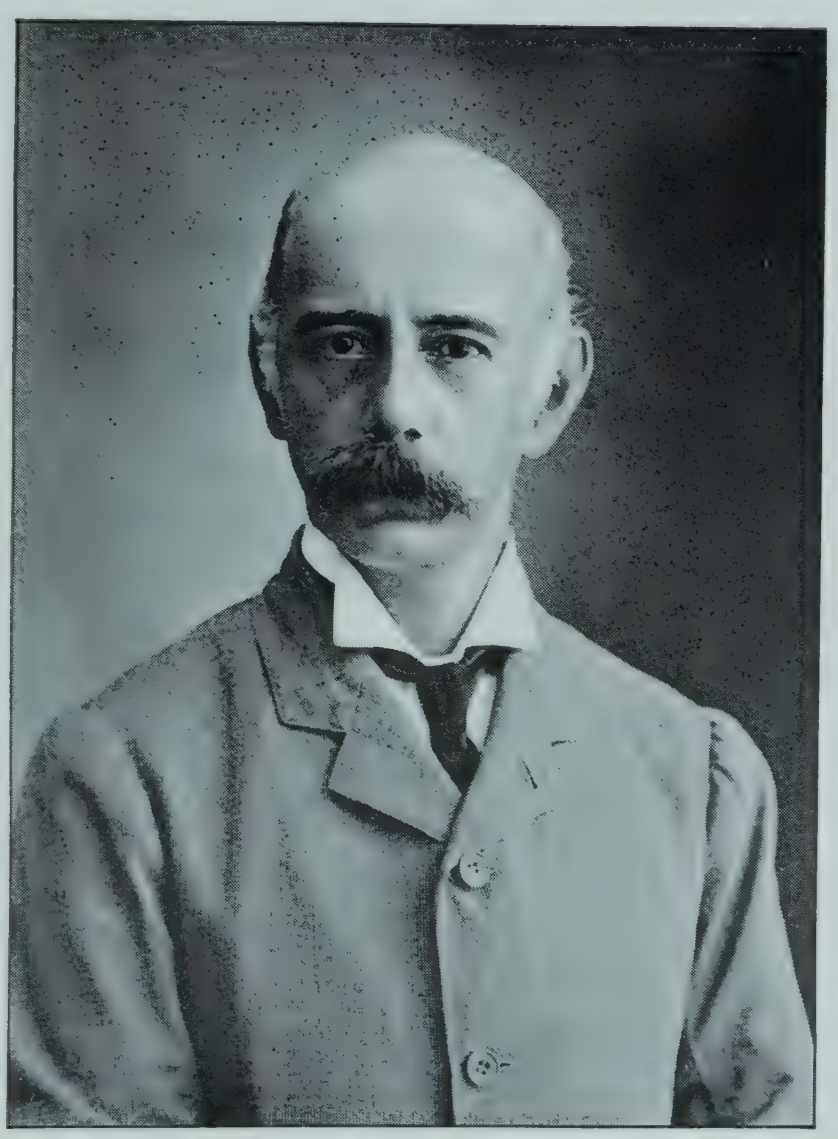
For full particulars of exhibits, *see* Special Section.

1 case containing 16¼ lbs. scrap in 6 balls.
4 lbs. clot.
8¼ lbs. small biscuits (67 biscuits).
7¾ lbs. large ,, (17 ,,).
3¾ lbs. small squares (27).
16¾ lbs. small sheets (26).
23 lbs. large sheets (12).

Cases glass containing Flowers and Fruit Para Rubber.
Wardian containing 12 Rubber Plants in pots.
Rubber Tree Stems packed in canvas.

EXHIBITORS.	VISITOR'S NOTES.
J. Winter, Trafalgar Estate, Singapore. 20 lbs. Para Sheet. 10 lbs. ,, ,, 10 lbs. ,, ,, 10 lbs. Scrap. 6 lbs. Clot.	

Different grades of Para Rubber are also exhibited by the following estates in the Federated Malay States:—
Labu, Beaumont, Terantang, Linsum, Auger-Augat, Batang-Kali, Sungei-choh, Inch-Kenneth and Lauadron.
Other estates are also represented, but the exhibits were received too late to be entered in the Catalogue.



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FOR

Malay Peninsula Agricultural Association,
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FOR

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Are invigorated by it, and made more resistant to attacks of disease. Potash also

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(48-52 % pure Potash.)

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Acts very beneficially on soils which contain a fair quantity of lime, and for crops such as MAIZE, COTTON, INDIARUBBER, TEA, COFFEE, COCOA and RICE.

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Is most suitable on light soils, and for COTTON and COCOA-NUT TREES. This Manure has valuable insecticide and fungicide properties.

(About 12·5 % pure Potash.)

☞ *In buying the above Manures one should see that the percentages are expressed as PURE POTASH, and are similar to the guarantees given above.*

In buying mixed Manures see that a considerable quantity of PURE POTASH is present in the mixture and expressed as such.

Our total annual output of Potash Manures for 1907 reached the colossal figure of—**5½ million Tons.**

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We shall be pleased at any time to give any information and forward pamphlets free on application.

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SINGAPORE.

No.	Exhibitor.	Quantity.	Description.
1	**Botanic Gardens, Singapore.**	4 lbs.	Para clot.
		8¼ lbs.	Para biscuits (small).
		7¾ lbs.	,, ,, (large).
		3¾ lbs.	,, small squares.
		16¾ lbs.	,, sheets (small).
		23¾ lbs.	,, sheets (large).
			Para flowers and fruit.
		2 stems.	Para trees.
2	**J. Winter, Esq.,** Trafalgar Estate.	20 lbs.	Para sheet.
		10 lbs.	,, ,,
		10 lbs.	,, ,,
		10 lbs.	,, scrap.
		6 lbs.	,, clot.

PENANG & PROVINCE WELLESLEY.

3	**Caledonian Estate.**		Flake Tapioca, grown as a catch crop.

MALACCA.

4	**Tan Chay Yan, Esq.,** Bukit Lintang Estate.	1	Photograph.
5	**Chan Koon Chay.**		

FEDERATED MALAY STATES.

6	**Flanters' Association.**	1	Malay House built in the Malay States. A typical Malay house.

PERAK.

7	**Cicely Estate.**	10 lbs.	Para sheet.
		10 lbs.	,, fine crepe.
		8 lbs.	,, scrap crepe.
8	**Kamuning Estate.**	1	Series Photographs.
			Para sheets.
			,, crepe.
			Castilloa Block.
9	**Jebong Estate.**	26 lbs.	Para crepe.
10	**Sungei Krudda Estate.**	1 parcel.	,, crepe.
		1	Photograph.

SELANGOR.

11	**Highlands Estate.**	30 lbs.	Para sheet, light smoked
		31½ lbs.	Para crepe, Pale No. 1.
12	**Vallombrosa Estate.**	5 lbs.	Para sheet No. 1.
		5 lbs.	Para scrap No. 1.
		5 lbs.	Para scrap No. 2.
		4	Photographs.
13	**Selaba Estate.**	39 lbs.	Para scrap.
			Para crepe.
14	**Pataling Estate.**	28 lbs.	Para crepe.
15	**Damansara Estate.**	28 lbs.	Para crepe.
16	**Bukit Rajah Estate.**	28 lbs.	Para crepe.
17	**Golden Hope Estate.**	28 lbs.	Para crepe No. 1.

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Store: 12/14, „ „ }

No.	Exhibitor.	Quantity.	Description.
	KAALA LANGAT S.M.S.		
18	**Klanang Estate.**	8 lbs.	Para block crepe No. 1.
		$9\frac{1}{2}$ lbs.	Para crepe scrap-block.
		$3\frac{1}{2}$ lbs.	Para crepe No. 1.
		12	Photographs.
19	**Linggi Plantations.**		Photographs.
20	**Botanic Gardens, Penang.**	1 parcel.	Para Rubber.
		1	Photograph of Para Rubber Tree planted in 1886 on very poor soil in Penang Botanic Garden. Present girth at 3 ft. from ground, 6 ft. $8\frac{1}{2}$ in. First tapped in 1897, and has been tapped on 13 occasions, furnishing 39 lbs. of Rubber, or an average of 3 lbs. per annum.

The next INTERNATIONAL RUBBER & ALLIED TRADES EXHIBITION will be held in London in 1910.

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The Netherlands and the Netherland Colonies.

THE Netherland interests in the "Rubber and Allied Trades" are, on the whole, more centred in the commerce and production than in the industrial use of the articles. The rubber industry of the Netherlands is limited to some few factories, but the allied industries, such as the manufacture of lacquer and varnishes, are carried on extensively, and the manufacture of asphalt is also of importance.

The principal place for the rubber trade is Rotterdam, where hitherto the Congo and East Indian varieties have mostly been imported, Amsterdam and Rotterdam being very important markets for other tropical gums and resins.

The most important interests of the Netherlands, also for the future, are centred in the present and shortly to be expected production of their extensive colonies.

1.—RUBBER.

It is only during the last years that the Netherland Colonies in Asia have attracted attention as a promising rubber country.

It is true that a number of caoutchouc producing plants and various Ficus varieties grow wild in the East Indian Archipelago and that the products of these plants have been since times immemorial collected in the forests and prepared by the native population; but the profits of this trade, which formerly were not inconsiderable, have been greatly reduced during the last decennials, in consequence of the inconsiderate way in which the work was carried on.

Whilst the export of wild rubber amounted in 1860 to over 1,200,000 kilogr., it had decreased in the "seventies" to less than 100,000 kilogr., after which, however, it has again increased.

Of far more importance than the native rubber-collecting are the extensive plantations of late laid out by the Government and by private persons, and which are still being considerably extended.

The first private rubber plantation in the Netherland East Indies dates from 1864, and is remarkable because it is probably the first, but certainly the oldest existing rubber plantation of the world. It consists of Ficus Elastica, and was established at Wera on the Pamanœkan and Tjiassem lands in the Island of Java. Of the trees then planted, over 5,000 are still living, and they are regularly tapped.

However, it was especially the Netherland Indian Government that displayed interest in the rubber cultivation in Java. In 1883, on the initiative of the then conservator of forests, Mr. A. H. Berkhout, the first Government rubber plantations in Java were

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laid out; but it was only in 1901 and following years that the rubber cultivation was taken strongly in hand by the forestry department.

The Government plantations in Java now cover an area of 6,828 hecteres (14,400 acres), and contain principally Ficus Elastica. In addition to this, a beginning was made in 1907 with the laying out of a Government rubber plantation at Langsar, on the east coast of the Island of Sumatra, where Hevea Brasiliensis is planted on about 1,000 "bouws" (1,750 acres).

The Netherland Indian Government has, however, done more for the rubber cultivation. Since a number of years, under the direction of Prof. Dr. M. Treub, experiments are made in the world-renowned botanical gardens at Buitenzorg in Java, and in the mountain garden at Tjibodas, belonging to them. These experiments are made on a large scale, and are amplified by scientific investigations of various varieties of rubber, the results of which are useful to rubber planters as well as to scientists. A large number of these investigations were carried out by Dr. P. van Romburgh, at present Professor at the University at Utrecht, whose book on "Caoutchouc en gutta-percha in Nederlandsch Indie" is also appreciated by foreigners.

Only during the last years, and then mainly with foreign capital, private rubber plantations have been established in the Netherland East Indies. Those with English capital are established mainly on the east coast of Sumatra and in Java, whilst in Java, as also on the west coast of Sumatra, there are many French and Belgian plantations, and a German company works a plantation in Borneo. Netherland capitalists begin more than hitherto to take an interest in the rubber cultivation.

The total area in the Netherland East Indies at present used for the rubber cultivation cannot be given, but is probably over 50,000 "bouws" (87,500 acres), out of which total there are 33,000 "bouws" (57,000 acres) in Java alone; but a much larger area is destined for this cultivation, and planting takes place on a large scale. In addition to the native Ficus Elastica, large numbers of Hevea Brasiliensis, which does exceptionally well in the Netherland East Indies, are planted, especially since 1905. Whilst the now existing plantations are for the greater part not yet producing, the extension ot the cultivation will soon be visible from the figures relating to the exportation.

According to the official statistics, the quantities of rubber exported by private persons was in

1890	149,210	kilogr.
1895	102,535	„
1900	219,309	„
1901	228,822	„
1902	193,615	„

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NETHERLANDS SECTION.

The same official statistics give for the exportation in the years 1903-1906 the following figures:

1903	669,299	kilogr.
1904	1,628,619	„
1905	2,072,589	„
1906	2,070,619	„

These figures, however, do not relate to the export of rubber only, but also include the export of Getah Djeloetoeng (ded Borneo of Besk), a product which contains only 5 to 10 per cent. of rubber, and is exported of late in increasing quantities.

The increasing importance of the Netherland East Indies as a rubber country is due to the special fitness of the soil and of the climate for the rubber cultivation, as well as to the abundance and cheapness of good labour, especially in Java. As, moreover, the Government encourages the development of the cultivation by providing good roads and by following a liberal fiscal policy, it is hardly doubtful that the Netherland Colonies in Asia will shortly occupy an important place among the rubber-producing countries of the world.

In Netherland Guiana (Surinam), where rubber-producing trees also grow wild, the cultivation of Hevea Brasiliensis likewise takes place of late. In 1907, under the guidance of Dr. van Hall, a beginning was made with the laying out of a Government rubber plantation, whilst on some other plantations Heveas are planted together with bacoven.

2.—Other Tropical Gums.

A. Getah-pertjah (gutta-percha).

It is well known that a great part of the commercial getah-pertjah originates from the Netherland Colonies in Asia. The trees which supply this product grow wild in the whole of Sumatra, Banka, Borneo, and the Riouw Archipelago. In Java, trees supplying good getah-pertjah are cultivated. The tree which is most liked is the Palaquium oblongifolium, which supplies a product of excellent quality, whilst the Payana Leerii, which gives a more resinous product, is also found very extensively.

The native population collects the getah-pertjah in the forests in such a careless and inconsiderate way, that the larger trees have almost entirely disappeared. The threatening danger of total extermination of the getah-pertjah trees in the Archipelago induced the Indian Government to begin in 1885 an experimental cultivation of these trees at Tjipetir (Preanger Regencies, Java). This has developed of late in the Government getah-pertjah plantation, which now covers an area of over 1,390 " bouws " (2,440 acres), and of which Dr. Tromp de Haas is Director. Only few private plantations are found in the Archipelago. The most important are established by a Netherland Company, which prepares getah-pertjah from the leaves in its factory in Singapore.

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NETHERLANDS SECTION.

The exportation of getah-pertjah by private persons amounted to :

1890	2,277,326	kilogr.
1895	1,347,834	,,
1901	1,828,926	,,
1902	1,061,076	,,
1903	790293	,,
1904	211,756	,,
1905	800,816	,,

B.—BALATA.

The balata forms a not inconsiderable exportation product of Netherland Guiana (Surinam). It is collected in the forests of the colonies in virtue of a permit of the Government, which charges a small duty for each permit. The holders of these permits hire native balata-searchers, and buy the product obtained for a fixed sum.

The exportation amounted in

1906	to	270,000	kilogr.
1907	,,	348,000	,,

The permits produced in 1907 fl. 97,000 (about £8,083).

C. OTHER GUMS AND RESINS.

The East Indian Archipelago, as well as Netherland Guiana, export various tropical gums which serve for the manufacture of lacquer and varnishes, as also of some dyes.

The principal East Indian gums are gum copal, gum damar, gum benzoe, and dragon-blood, whilst Surinam supplies locus resin and gum copaivial.

These gums are obtained partly by tapping or cutting down trees, partly they are found in fossilated condition in the tropical forests.

The collection of these products is an important source of income for the native population of several regions in Sumatra, Borneo, Celebes, the Moluccoes, and elsewhere.

The exportation from the East Indian Archipelago of gum damar was in

1904	4,078,367	kilogr.
1905	4,766,410	,,
1906	5,640,151	,,

and of gum copal in

1904	8,071,667	kilogr.
1905	8,609,852	,,
1906	9,216,216	,,

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A Telegraph-Map of the Netherland East Indies.

A Map of the East Indian Archipelago. Scale 1, 2,500,000 (with register of plan names), published by the Colonial Department.

A book, "Regenwaarnemingen in Nederlandsch Indie over 1196" (observations about rain in the Netherland East Indies in 1906)

A book, "Deel 1 der Regenwaarnemingen in Nederlandsch Indie over 1907, Dagelyksche Regenval. (Part 1 of the observations about the rainfall in the Netherland East Indies in 1907; Daily Rainfall).

Colonial Museum at Haarlem (foundation of the Society for the Promotion of Industry. Director: Dr. M. Greshoff. Conservator: H. A. A. van der Lek.

A. Caoutchouc, 12 Samples:

1. Karet batang of Seloema, from Benkoelen (Sumatra).
2. „ „ of Chilocarpus costatus, trom Kaoer (Sumatra).
3. „ akar, Moko-moko (Benkoelen, Sumatra).
4. „ first quality, from the Lampong districts (Sumatra).
5. „ galoe, from Cheribon (Java).
6. Getah soesoe, from Sampit (Borneo).
7. „ djintaan, from Montrado (N. Borneo).
8. „ gintaan, from Borneo.
9. „ gintan (of Willugbeia firma), from Sumatra.
10. „ boeeh, from Montrado (Borneo).
11. Caoutchouc, from Assahan (Sumatra's Oostkust).
12. „ from Atjah (Sumatra's Noordkust).

B. Getah Pertjah. Samples:

13. 1—Getah pertjah of Palaquim spec., from Borneo.
14. 2— „ „ from Bandjermasin (Borneo).
15. 3— „ njatoe, from Montrado (Borneo).
16. 4— „ doerian, from Sintang (Borneo).
17. 5— „ sangai, from Sambas (Borneo).
18. 6— „ halam tembago, of Palaquium oblongifolium Bark, from Sumatra.
19. 7—Getah halam tembago, purified, from Dr. Burck.
20. 8— „ poetih, prima, from Sumatra's Westkust.
21. 9—Balam baringin, from the Batoe Islands, Sumatra.
22. 10—Getah balam moeda (of young plantan), from Bengkalis (east coast of Sumatra.)
23. 11—Getah pertjah from Atjeh.
24. 12— „ soendi, from Bengkalis.
25. 13—Koudang, from the Preanger Regencies (Java).
26. 14—Getah pertjah from Ternate.
27. 15— „ „ made from leaves (mechanical method, 1904, of the Ned. Gutta Percha Co., Ltd.).
28. 16—Bottle made of getah pertjah, for keeping aqueus hydrofluoric acid.
29. 17—Cigar case made of getah pertjah, from Padang (Sumatra).
30. 18—Box made of getah pertjah, from Sumatra's Westkust.
31. 19—A small vase of getah pertjah, made by natives of Borneo.

C. Balata. All the following from Surinam. Monster Samples:

32. 1—Raw balata.
33. 2—Raw Balata.
34. 3—Balata.
35. 4— „ very fine quality from Boven-Para.
36. 5— „ tapped and dried by Creole labourers, from Nickerie, Surinam.

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37. 6—Balata, dried on the leaves.
38. 7—Sample of a Balata driving belt, 50 mm., 3 layers.
39. 8— „ „ „ 125 mm., 4 layers.
40. —Whip made of balata, painted.
41. — „ „ from two ends Twisted.
42. a & b—Two small shelves of Mimusops balata (Bolletrie).
43. A larger shelf of Mimusops balata (Bolletrie), polished on one side.

D. Gum Damar.

44. 1—Damar, prime quality, Batjan.
45. 2— „ Tjongal, good "damartraan," from Bengkalis (east coast of Sumatra).
46. 3— „ mesegar, from Moko-moko, Benkoelen (Sumatra).
47. 4— „ Salo, from Halmaheira (Moluccoes).
48. 5— „ from Sumatra.
49. 6— „ Sorang (of Hopea maranti), from Banka.
50. 7— „ itam, two torches of damar, from Ternate.

E. Gum Copal.

51. 1—Copal, natural, unscraped, hard, from Gorontalo (Celebes).
52. 2— „ „ "native cleaned," somewhat scraped by the natives, from Gorontalo.
53. 3— „ very well scraped, hard, white, yellowish.
54. 4— „ hard, light yellow, from Gorontalo.
55. 5— „ hard, yellow brown, from Loewoe (Celebes).
56. 6— „ hard, dark brown, from Loewoe.
57. 7— „ with gooseskin and insects caught in.
58. 8— „ with insects caught in.
59. 9—Object of Copal, made by natives.
60. 10—Collar chain made of Copal.
61. 11—Photograph : copal collectors in New Guinea.

F. Dragon Blood of Daemonorhops Draco.

62. 1—Commercial Sample.
63. 2—Sticks of Dragon Blood, prime quality, in the original packing.
64. 3—Lontar leaf, painted with dragon blood, in palm leaf.
65. 4—Branch with fruits of Daemonorhops draco.

G. Benzoe (of Styrax Benzoin).

66. 1—Commercial Sample from Palembang (Sumatra).
67. 2—Benzoe from West Sumatra.
68. 3—Benzoe in a box of bark, in which it is collected (Palembang).
69. 4—Piece of the trunk of Styrax benzoin, with resin running out (Palembang).

H. Various.

70. Model of a Sudanese House, Buitenzorg (Java).
71. Model of a house for the Gamelan native orchestra, from Bandjermasin (Borneo).
72. Small models of Gamelan, with players : 9 sitting, 5 standing figures, 9 musical instruments.
    N.B.—The Gamelan belongs to the inventory of several Caoutchouc and other plantations, and serves to occupy the labourers during their leisure.
73. Print in colours : View in the Bamboe Hall of the Colonial Museum.
74. Photograph : View on the Colonial Museum.
75. „ „ „ „ „
76. „ View in the Laboratorium of the Colonial Museum.
77. Medal of the Museum.
78. Rumphius Medal.
79. Complete set of books published by the Colonial Museum, with printed list thereof.

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NETHERLANDS SECTION.

The Netherland Commission :

(a) Literature on Rubber :

Dr. P. van Romburgh, Caoutchouc en Getah Pertjah in Nederlandsch-Indie, Batavia, 1900.

Dr. P. van Romburgh, Les Plantes a caoutchouc et à gutta percha, cultivees aux Indes Neerlandaises (avec 15 planches et 1 carte), 1903.

A. Slingervoet Ramondt, Zur Geschichte der Kautschuk forschung.

(b) Collection of prospectuses, articles of association, and annual reports of various rubber plantation companies in the Netherland East Indies.

The Netherland Commission :

Netherland East Indian Gums :

No. 1. Sample of Gum Copal, blank.
No. 2. „ „ „ brown.
No. 3. „ Padang Gum Dammar.
No. 4. „ Batavia „ „
No. 5. Black Borneo Gum.

Exhibit of the Sub-Commission of the Netherland West Indian Colonies.

(a) A piece of bolletree or bulletree polished on the front side, framed in brown lard.
On this will be found a drawing showing the production of balata and the concessions for working balata for the period 1893–1907 (both inclusive).

(b) A case containing 3,200 grammes of the first plantation rubber from Surinam, obtained from ten-year-old trees of the plantation " Waterland " (Hevea brasiliensis).

(c) 1½ kilogr. Castilloa Rubber from the plantation " Clevia."

(d) A lot of Locus resin.

(e) A roll of balata ; weight 18 kilogr.

(f) Two Wardian cases, one with bolletree plants, and one with Hevea guyanensis.

(g) Various photographs, viz.

I. Mixed cultivation of Hevea brasiliensis (3 years) old and bacoven on the plantation " Clevia."
II. Ten-years-old rubber trees (Hevea brasiliensis) on the plantation " Waterland."
III. Ten years old rubber trees (Hevea brasiliensis) on the plantation " Waterland."
IV. Eight years old Castilloa tree on the plantation " La Liberte."
V. Three years old rubber trees (Hevea brasiliensis) on the plantation " Wederzorg."
VI. Four years old rubber trees (Hevea brasilensis) on the plantation " Voorburg."
VII. Hevea tree (Hevea Guyanensis) in the original forest, being tapped.
VIII. Three years old rubber tree on the plantation " Voorburg."

Exhibit No. 6.

The Government of the Netherland East Indies.

Ficus Elastica Rubber in balls, 196 kilogr.

Gutta Percha made from leaves, 16 tins, 90 kilogr.

Djeloetoeng (Gutta Percha—Dyera Lowii Hook and Dyera Castulata), originating from Palembang (South East Sumatra), in blocks.

Djeloetoeng of Fischer, Palembang, in cakes.

Djeloetoeng, originating from Pontianak (Western Borneo).

Djeloetoeng, originating from Bandjermassin (South Eastern Borneo), in formaline.

Hangkang (Gutta Percha—Palaquium biocarpum) from Borneo, 4 tins, in water.

Fat from Palaquium Seeds, 4 tins, 24 kilogr.

Gutta Percha, Palaquium Oblongifolium, tapping product, about 100 kilogr.

Ficus Elastica, samples from the Forestry Department in Java.

Photographs and Maps of the Government Gutta Percha Plantation at Tjipetir (Preanger Regencies, Java), and others from the Forestry Department in Java.

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NETHERLANDS SECTION.

EXHIBITORS.

VISITOR'S NOTES.

Exhibit No. 1.

The Netherland Corminiegion.

1 case of samples of Batjan Gum, imported by **Messrs. Van Overzee & Co.,** of Rotterdam, viz.:

1 sample of Gum Copal, B.C.C. M. soft copal.
" " " N. "
1 " " " P. "
1 " " " R. "
1 " " " H. hard "
1 " " " H1 hirve "
1 " Gum Damar.

Exhibit No. 2.

Nederlandsche Caoutchouc en Gutta Percha Fabriek, St. Joris, firma Bakker & Zoon, at Ridderkerk, Holland.

Rubber articles such as Valves, Packings, Sheets, Cycle and Motor Tyres, Gutta Percha, and hard Gummi Articles, mixed Rubber and Asbestos Packings, etc.

Exhibit No. 3.

Gebroeders Merens (Merens Brothers), Fabriek van Caoutchouc-Artikelen, Zuider Buitenspaarne, 56, Haarlem, Holland.

Articles made of India Rubber for technical purposes.
Ebonite in various forms.

Exhibit No. 4.

Amsterdamsche Caoutchouc-Fabriek, voorheen Pompe & Co., 3e Wittenburger Dwarsstraat, 2, 4, 6, Amsterdam.

Rubber Flooring Tiles, Coats of Arms of England and the Netherlands.

Exhibit No. 5.

Internationale Guano en Superphosphaat Werken, at Zwyndrecht, Holland.

Show Case with various Bottles of Fertilisers.

Exhibit No. 6.

The Government of the Netherlands East Indies.

See Government Section.

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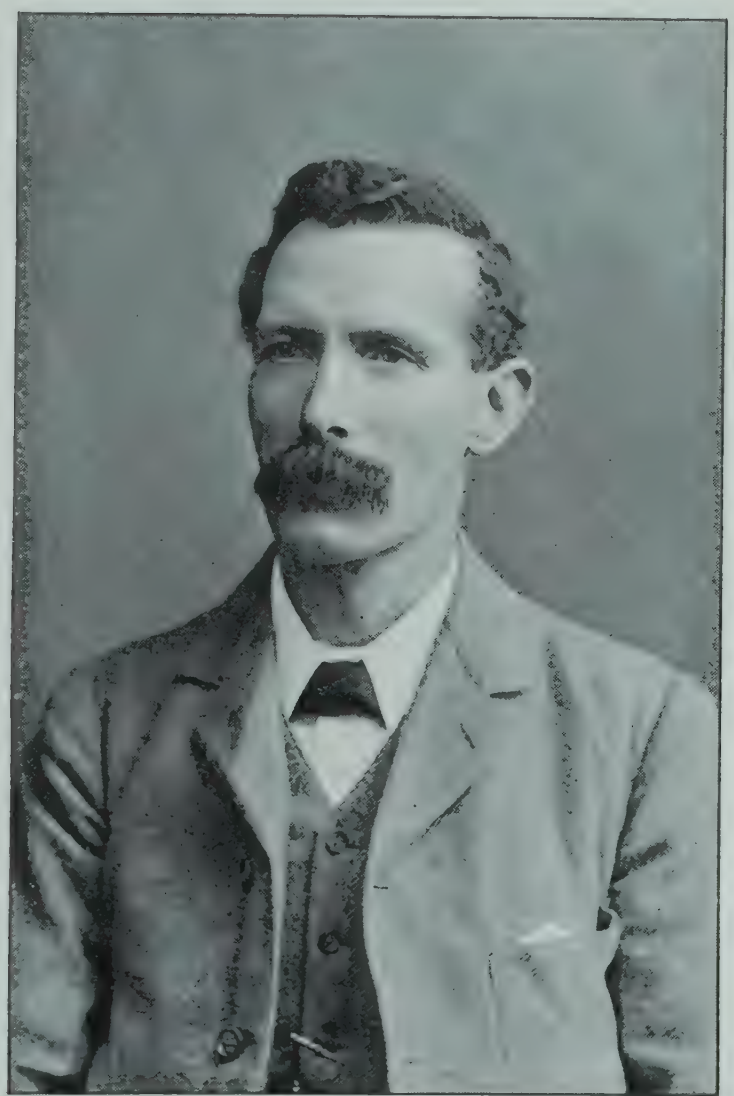

LT.-COL. D. PRAIN, M.A., M.B., F.R.S., &c.,
Director, Royal Botanic Gardens, Kew.

EXHIBITORS.

VISITOR'S NOTES.

Exhibit No. 7.

Deli-Maatschappy (Deli Company), established at Medan (East Coast of Sumatra), the management of which is at Amsterdam (173, Keizersgracht). Tobacco and Rubber plantations in the Sultanate of Deli, Residency of the East Coast of Sumatra.

Samples of Ficus Elastica in sheets, cakes, and balls all taken from six-year-old *Ficus Elastica* trees, and no acid whatever was mixed in the latex to stimulate the coagulation. Only during tapping of the trees a small quantity of *ammonia liquida* was made use of in the drip-tins.

A. **White Transparent Sheets.**—Immediately after tapping the trees the latex is purified by means of a very close sieve, and left alone for about three days to settle; then the latex is skimmed from the sediment and coagulates whilst being constantly stirred. The rubber obtained is pressed in very thin sheets, and these sheets are submerged in water to soak for about two weeks. The water requires frequent refreshing. After soaking, the sheets are pressed for a second time to remove the water, and dried in an air-cooled room for about 8 days. The sediment is treated as described under *C*.

B. **Brownish Sheets.**—Tapped and coagulated as above, but pressed in thick sheets; afterwards soaked in water, and pressed again and dried just as under *A*.

C. **Deep Brown-blackish Sheets.**—Tapped and sieved as under *A* and *B*; pressed in thick sheets to dry immediately without washing or soaking.

D. **Black Cakes or Blocks.**—These come from the sediment in the tins used during tapping, which sediment is scraped out and pressed in cakes or blocks. (This rubber contains small pieces of bark, etc.)

E. **The Sheets and Cakes** (blocks) treated as under *A*, *B*, *C*, and *D* are hung in a dense smoke of a grass-fire fed with palm-seeds, so as to be proof against putrefaction and mould during transshipment to Europe.

F. **Red Balls.**—This is rubber dried on the tree and scraped from the wounds 24 hours after incision. The balls are stored in air-cooled rooms to lose all dampness.

Exhibit No. 8.

Rubber Cultuur Inderneming Tji-bening (Residency of Preanger Regencies, in Java).

Ficus Elastica in 65 balls.

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EXHIBITORS.

VISITOR'S NOTES.

Exhibit No. 9.

Cultuur Maatschappy Pangledjar (established at Batavia.) Cinchona, Coffee and Rubber Plantations, in the Residency of Preanger Regencies in Java.

Samples of Hevea Rubber.

Note.—These samples have been exposed for over two years to light and air.

Exhibit No. 10.

Maatschappy tot exploitatie van het land Tjimangies (established at Buitenzorg, Java). Private lands in the Residency of Batavia, division of Buitenzorg, Java.

Samples of Ficus Elastica Rubber.

Exhibit No. 11.

Cultuur Maatschappy Kali Djerveh (established at Sourabaya, Java). Coffee and Rubber Plantation in the Residency of Pasoeroean, division of Loemadjang, Java.

Ficus Elastica Rubber and Photographs.

Exhibit No. 12.

Particulier land Tjikandi Ilir, Residency of Bantam, division of Serang, Java. (Rice. Coffee, and Rubber Plantation).

Ficus Elastica, viz. :—

1 cone of 40 kilogr., dried on the tree (brownish).

1 cone of 15 kilogr., gathered on leaves and dried on those leaves (white).

Exhibit No 13,

Cultuur Onderneming Pasir Waringin (Java).

3 Photographs.

Exhibit No. 14.

Messrs. L. Platon & Co., at Batavia, Java.

Various samples of commercial Rubber.

Exhibit No. 15.

Maatschappij ter Exploitate der Pamanoekan en Tjiassem Landen (Pamanoekan & Tjiassem Company), established at 313, Keizersgracht, Amsterdam (private estates in the division of Krawang, Residency of Batavia, Island of Java).

2 Ficus Cakes, mark P.B., weight 5½ kilo. net.

4 Castilloa Cakes, mark P.B., weight 8 kilos. net.

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EXHIBITORS.

VISITOR'S NOTES.

20 Hevea Leaves, mark P.B., weight ½ kilo. net.
1 Ball of Castilloa (raw), mark P.B., weight 1 kilo. net.
1 Ball of Ficus (raw), mark P.B. weight 1 kilo. net.
1 case of Utensils for tapping Hevea (11 in all).
6 Balls of Ficus, marked S.B., weight 4½ kilos. net.
3 Rolls of Ficus Leaves (each 6 leaves), S.B., weight 2½ kilos. net.
3 Rolls of Castilloa Leaves (each 6 leaves), S.B., weight 2½ kilos. net.
6 Cakes of Castilloa, S.B., weight 9½ kilos. net.
3 Ficus Balls (raw), S.B., weight 1 kilo. net.
3 Castilloa Balls (raw), S.B., weight 1½ kilo. net.
3 glass-stoppered Bottles with Seeds (1 Hevea, 1 Ficus, 1 Castilloa).
1 Case of Utensils for tapping Ficus and Castilloa (4 in all, mark S.B.).
3 Boxes of Blocks.
1 Map.

Exhibit No. 16.

Full description of the Samples of Commercial Rubber of the firm **L. Paton,** at Batavia; exhibited by Het Algemeen Nederlandsch Indisch Rubber Syndicaat te Batavia. (The General Netherland Indian Rubber Syndicate at Bavaria).

(*a*) Plantation Rambong (breads).
(*b*) ,, ,, (small balls).
(*c*) Rambong, native prepared (small balls).
(*d*) ,, cleaned (rolls).
(*e*) ,, rolls.
(*f*) ,, (wild rubber), big balls.
(*g*) ,, ,, ,, (cut in two).
(*h*) ,, second quality (average Lampong quality).
(*j*) Djonkulan (Bantam), wild rubber (Rambong mixed up with Liana rubber).
(*k*) Native prepared Castilloa Rubber (sausages).
(*l*) Liana Rubber (ginger).
(*m*) Native prepared Ceara Rubber (balls).
(*n*) ,, ,, Hevea Rubber.
(*o*) Liana Rubber (probably Llandolphia).
(*p*) Tachy Rubber, cleaned and pressed, for export.

Exhibit No. 17.

Weise & Co., Rotterdam. And Koloniale Handel en Consignatie Maatschappy. Semarang, Tjilatjap, Cheribon, Tegal—Java; Paneh, Sumatra; Ternate, Moluccas.

Crude Rubber—Africans and East India.
Gutta Percha—Sumatra and Borneo.
Balata—Surinam and Venezuela.
Gum Copal—Moluccas.

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1909.

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EXHIBITORS.

VISITOR'S NOTES.

Exhibit No. 18.

Maatschappy tot Exploitatie der Pamanoekan en Tjiassem landen. (Fuller description of the photographs mentioned in former lists).

A. Soebang Plantation.

I. Wanaredja Block, 8 years old (Ficus elastica).
II. Trees (Ficus elastica) in the Wera Block, 38 years old.
III. Avenue in the Wera Block.
IV. In the centre of the Wera Block.
V. Ficus elastica, 38 years old, standing in the square at Soebang.
VI. Ficus elastica, 4 years old, Tji Erang Block.
VII. Ficus elastica, 18 months old, Tji Kaka Block.
VIII. Hevea Brasiliensis, yearlings at Soember Barang Block.
IX. Hevea Brasiliensis, 30 months old, at Tji Kaka Block.
X. Ficus elastica, 16 months old, at Tji Kaka Block.
XI. Hevea Brasiliensis, 18 months old, at Tji Peo Block.
XII. In the factory at Soebang.

B. Warong Redja Plantation.

XIII. Ficus elastica, yearlings at Haoer Goelir Block.
XIV. Mixed growth, 3 years old, Hevea Brasiliensis, and 5 years old, Ficus elastica, at Tji Tjoekoeng Block.
XV. Ficus elastica, 5 years old, at Tji Tjoekoeng Block.
XVI. Castilloa trees, 7 years old, at Warong Redja.
XVII. On the left : Ficus elastica, 5 years old ; on the right : Hevea Brasiliensis, 3 years old, at Medgite Block.
XVIII. Hevea Brasiliensis, 3 years old, at Medgite Block.
XIX. Hevea Brasiliensis, 20 years' old trees, at Medgite Block.
XX. Hevea Brasiliensis, 26 years' old trees, at Medgite Block.

C. Kasso, Malang Plantation.

XXI. Avenue of 7 years' old Castilloa trees at the Batoe Sirap Block.

Exhibit No. 19.

Landbouw—onderneming Dolok en Taleon Saragi. (Residency, East Coast of Sumatra ; division, Batoe Bahra. Plantation of Birenstihl and Sulger.)

Getah rambong (4 cakes), together, about 10·6 kilogr.
Getah rambong (one tin, pressed in), 1·4 kilogr.

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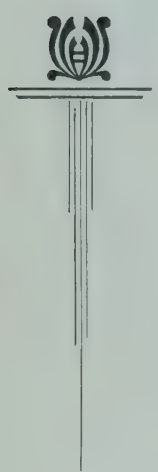

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THE NETHERLAND'S SECTION.

EXHIBITORS.

VISITOR'S NOTES.

Exhibit No. 20.

De Rubber planters—Vereeniging at Bandjar (Java). President: Mr. R. N. G. Bingley.

Maps showing the various rubber plantations affiliated to the Association.

10 Photographs.

Exhibit No. 21.

Plantagen Gesellschaft Boenisari, established at Bandoeng. (Plantations Boenisari I.–III., near Garoet. Preanger Regencies, Java—tea, cinchona, cocoa and rubber cultivation).

15 Photographs.

Exhibit No. 22.

Anglo-Java Rubber Co., established at Batavia. Plantations, Bandjarsari and Tjigajam (near the railway halt, Bandjar). Residency, Preanger Regencies, Java.

4 Photographs.

Exhibit No. 23.

Landbouw onderneming Tjiseroe, near the railway halt, Tjipari. Residency, Banjoemas, Java.

9 Photographs.

Exhibit No. 24.

Particulier land Tjikandi Ilir (Java).

4 large Photographs.

Exhibit No. 25.

Algemeen Nederlandsch Indisch Rubber Syndikaat.

Three large Photographs, viz. :

No. 1. Old Government gardens near Poerwakarta (Residency, Krawang), Java. Ficus elastica, grown up straight and near together.

No. 2. Ditto, grown up in the shape of a fork, without any air roots, and with easily tappable bark surface.

No. 3. Ditto, trunks of Ficus elastica trees cut down, at 2½ feet above the ground, with strong new outrunners, which proved to be well tappable again in four of five years, and supplied rubber of very good quality.

THE NETHERLAND'S SECTION.

EXHIBITORS.

VISITOR'S NOTES.

Exhibit No. 26.

Bantamsche Plantagen Maatschappy, established at 87, Jan van Nassaustraat, The Hague. Caoutchouc cultivation plantation, Nieuw Tjisalak, near the railway station, Rangkas Betoeng. Residency, Bantam, Java.

Photographs of Hevea Brasiliensis and Ficus Elastica plantations.

Exhibit No. 27.

Belgisch Nederlandsche Cultuur Maatschappy, established at 197, Heerengracht, Amsterdam. Caoutchouc plantations, Tjirandi, Passir-Empoel and Tjoeroeg. Residency, Preanger Regencies, Java.

Photographs of rubber trees three years old.

Exhibit No. 28.

Messrs. Da Costa & Co., at Paramaribo (Surinam). Address at the Hague, Holland: J. H. de Granada, 20, Laar van Meerdervoort.

Mark:

Various samples of Balata.

Exhibit No. 29.

The Sims Rubber Estates, Limited, 4, Lloyds Avenue, London, E.C. (London Agents: Rowe, White & Co., Ltd.) (The Sims Estate is in Soerakarta, Java).

Samples of Rubber.

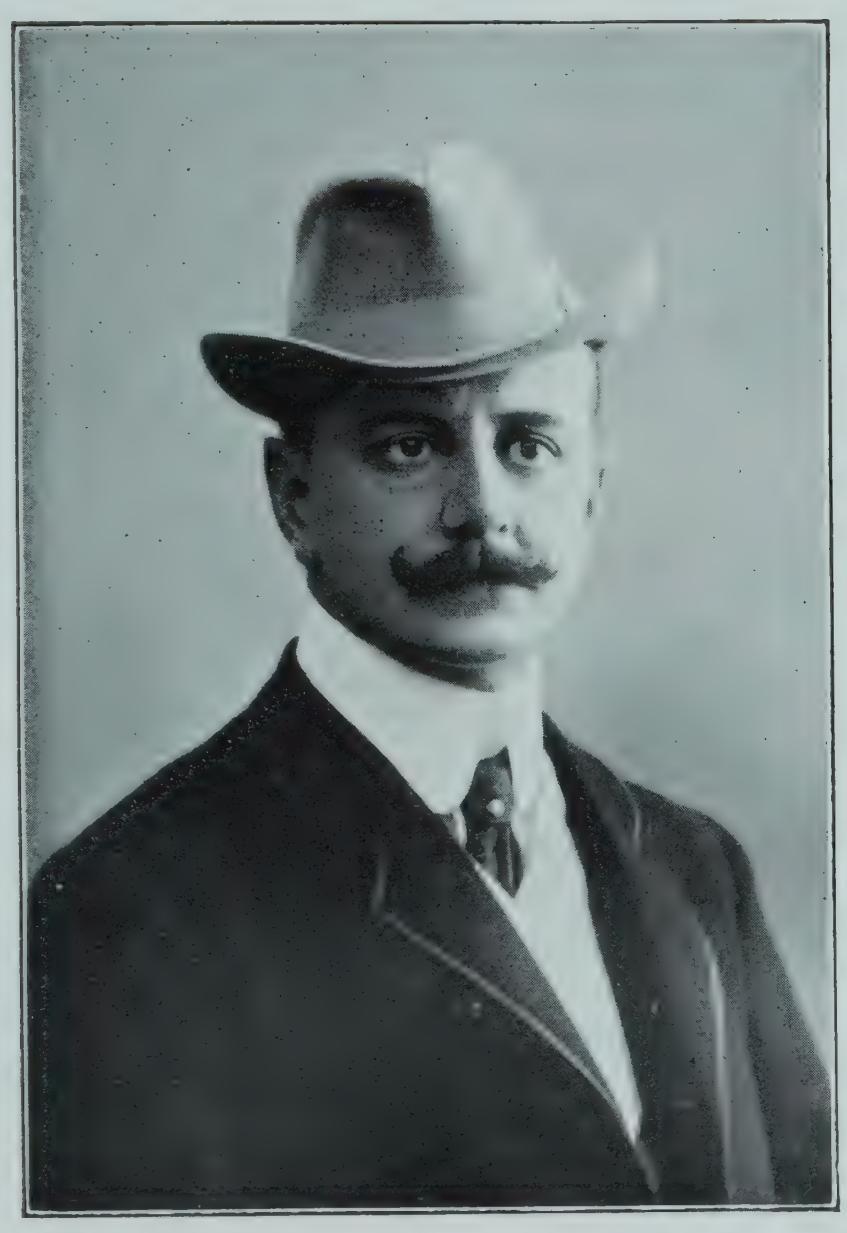
1. Rambong rubber from the Fiscus Elastica tree (by dry extraction.)
2. & 3. Castilloa Rubber (by wet extraction.)

Exhibit No. 30.

L. Platon, Batavia, Java.

A. Various commercial samples of Gum Dammar and Gum Benzoë.

No.			
1	Gum Dammar	No. 1.	Batavia Picking.
2	„	„ No. 2.	
3	„	„ No. 3.	
4	„	„ No. 4.	
5	„	„ No. 5.	



A. G. N. SWART, ESQ., LL.D.,

President and General Commissioner
of the Netherlands to the Exhibition.

No.	EXHIBITORS.		
7	Gum Dammar	No. 1.	Unpurified.
8	,,	No. 2.	
9	,,	No. 3.	
10	,,	No. 4.	
11	,,	No. 5.	
12	,,		Trash.
13	,,	No. 1.	Dust.
14	,,	No. 2.	
15	,,	No. 3.	
16	Gum Benzoe	No. 1.	
17	,,	No. 2.	
B. 18	Castilloa Elastica	Rubber.	

VISITOR'S NOTES.

Exhibit No. 31.

Siak-Rubber, Maatschappy (Siak, Sumatra).

Photographs, with maps of the situation and a map of Sumatra.

Exhibit No. 32.

J. Pohl, Buitenhof, the Hague, Holland.

Hardgummi trousse, containing Chirurgical Instruments, as supplied to the Netherland Indian Army.

Hardgummi truss, cushions.

Exhibit No. 33.

Chemische Fabrick "Kampen," at Kampen (Holland).

1. Carbonate of Magnesia (British Pharmac.).
2. ,, ,, (Technical).
3. Heavy Oxide of Magnesia.
4. Light ,, ,,
5. Magnesia Stone.
6. Isolation material for making and covering steam pipes.
7. Product for making sanitary flooring.

Exhibit No. 34.

J. G. von Hemert, Keizersgracht, 757, Amsterdam.

1. Plan showing total production and production of the firm of J. G. von Hemert, of Surinam, Sheet, Balata.
2. 600 kilogr. of Mercantile Sheet Balata, under the mark J. G. v. H., without or with various contra-marks.
3. Unpurified Rolled Balata.
4. Purified Rolled Balata.
5. Trunk of Bolletrie or Bulletree tree (Mimusops balata).
6. Ditto, tapped.
7. 3 pieces of Bolletrie or Bulletree (Mimusops balata).
8. Red India Woman. An image made of raw balata, supporting a basket with Surniam fruit.
9. Two stag-horns made of raw balata.
10. A hen sitting on eggs, made of raw balata.
11. Two dog-whips, made of raw balata.
12. A snake.

THE NETHERLAND'S SECTION.

"Boeatan," Magazijn van Indische Kunstnijverheids, artikelen der Vereeniging "Oost en West." (Boetan, Warehouse of articles of Indian Applied Art of the Society "East and West"). Heulstraat, 19, The Hague, Holland.

A. Nos. 1–40 : Various woven and "batikked" (painted with wax) wearing apparel of natives of the East Indian Archipelago. Nos. 1 and 2, from the island of Timor. Nos. 3, 8, 16, 18–27, 29–30, 33–34, 36. 38–40, from the island of Java. Nos. 4–7, from the island of Celebes. Nos. 10–15, from the island of Bali. No. 17, from the island of Sumatra (Atjeh). Nos. 28, 31, 32, 35, 37, from the island of Madeira.

B. Nos. 41–54, hand worked brass domestic utensils of natives of the East Indian Archipelago. Nos. 41–49, 51, lamps, kettles, saucers from the island of Sumatra. Nos. 50, 52–54, saucers and vases from the island of Java.

C. Nos. 55–60, painted leather figures, as used for the East Indian stage (Wajang).

All articles mentioned under A, B, and C are for sale.

Summatra-Deli Rubber Estates, Ltd., 13, St. Helens Place, London, E.C. Estates at Serdang, Residency of East Coast of Sumatra, Netherland East Indies.

A. Photographs :

No. 1.—Ficus Elastica (Rambong) Nursery.
No. 2.—Tapioca Plants, with young Ficus Elastica trees in the background and light railway.
No. 3.—Ficus Elastica (Rambong) trees, 4 to 5 years old.
No. 4.—Ficus Elastica (Rambong) trees, 5 to 6 years old.
No. 5.—Ficus Elastica (Rambong) trees, 7 to 8 years old.
No. 6.—Ficus Elastica (Rambong) trees, 16 to 25 years old.
No. 7.—Tapioca Factory.
No. 8.—Portion of interior of Tapioca Factory.

B. 2 samples of Ficus Elastica (as these samples are remarkable, the following analysis are added) :

"*April 6th*, 1908.

"The following is the analysis of Rubber you handed us on the 3rd inst.

Moisture	16.7 per cent.
Albumenoids	1.0 ,,
Resin	4.9 ,,
Ash	1.5 ,,
Caoutchouc (by diff.)	75.9 ,,

"In addition to which we notice a certain amount of specks, or what appears to be vegetable matter, amounting in weight anywhere up to 1 per cent. ; this would be returned under the above analysis under the heading of Caoutchouc.

"LEWIS & PEAT."

"6, *Mincing Lane, London, E.C.*,
June 20th, 1907.

"We have received the sample of Rubber you handed us, and beg to report as follows :—

"It is fine, clean, red Rambong (*Ficus elastica*). This kind of Rubber up to now has only been coming in small quantities, but there are a good many estates in Malaya, including Java and Sumatra, which are growing this species.

H. S. J. MAAS, ESQ.,

Consul General for the Netherlands, London.
Hon. President (London)
Netherlands Committee.

THE NETHERLAND'S SECTION.

"It is a first-class Rubber, and if brought to the market in sufficient quantities would meet a ready demand and realise very good prices. The sample that you send us is beautifully prepared, and we could suggest no improvement, but think that for curing and preparing large quantities for the market, it would be advisable to put the coagulated latex through a Crepe machine, and send it home in Crepe form. We have had small quantities like this, and it has sold well, and bids fair to be the most popular amongst buyers and consumers.

"Of course, plantation grown Rambong has not had a really fair trial yet, owing to scarcity of supplies, but we are confident that, when larger and more regular shipments come along, and the preparation is even and reliable, it will take its proper place in the Plantation Rubber Market.

"LEWIS & PEAT."

De Soember & Kedongdowo, Ondernemingen (Sultanate of Solo, Java). Office : Soember Lawang, Solo, Java.

Photographs :

No. 1. ..	December, 1905 ..	Para Rubber, 9 months old ; height of trees, 9 ft.
No. 2. ..	December, 1905 ..	Para Rubber, 9 months old ; height of trees, 6 ft.
No. 3. ..	December, 1905 ..	Ficus elastica, 9 months old ; 5 ft. high.
No. 4–5. ..	December, 1905 ..	Ficus elastica, 9 months old.
No. 7. ..	December, 1905 ..	Manager's House.

The Brazilian Rubber Trust
LIMITED.

THE EXHIBIT OF THE BRAZILIAN RUBBER TRUST, LTD., will be found to the left of, and near the Main Entrance ———to the Exhibition from Addison Road Station.———

It comprises native-cured specimens of Fine Islands Pará Rubber from the Company's Estates, and some excellent photographs of forest-grown Pará Rubber trees (*Hevea brasiliensis*) and of the methods of tapping, smoking, or curing, cutting and packing Pará Rubber. Specimens of the paddles on which the Rubber is cured and of the tapping axes employed by the natives are also shown in the Exhibit.

The following Particulars of the Company are appended:

CAPITAL - - - £37,500.

ISSUED CAPITAL - - £33,131.

SITUATION OF ESTATES—Anajas, Island of Marajó, State of Pará, Brazil.

AREA OF ESTATES—284 square miles, or considerably over 150,000 acres.

AVERAGE ANNUAL PRODUCTION OF PARA RUBBER (5 years)—129 metric tons, or 284,316 lbs.

AVERAGE ANNUAL VALUE OF CROP AT LONDON PRICES (5 years)—£62,233.

DIRECTORS:—

JOHN ORMISTON LAWSON-JOHNSTON. | WILLIAM PERFECT LAPAGE,
EUSTACE COLLET BROWN. | ASHMORE RUSSAN.

SECRETARY—EDWARD FREELING JOHNSTON.

LONDON OFFICE—Alderman's House, Alderman's Walk, Bishopsgate Without, E.C.

SPECIAL NOTICE.

With a view to increasing the already considerable production from the forests on its Estates, and to the establishment in addition of extensive plantations, the Brazilian Rubber Trust, Ltd., is now being reorganized with the object of providing the Working Capital necessary for such increase and plantations. Particulars may be obtained from the Secretary as above.

The Brazilian Rubber Trust, Ltd. acquired its Estates in 1901 from the pioneer English Company owning forests of Pará Rubber on the Amazon. The Directors have consequently had many years' experience of the working of such properties in Brazil.

THE WORLD'S PRODUCTION OF RUBBER.

This is about 70,000 tons. It is not generally recognised that of the above large quantity, Brazil and the rest of South America produce about 60 per cent., or, say 42,000 tons.

The State of Pará, where this Company's Properties are situated, is, of course, the original home of the Pará Rubber Tree, and, consequently, of Pará Rubber.

The average production for the past four years of the Islands District alone of the State of Pará (in which, as above stated, the Company's properties are situated) has been 7,028 tons per annum.

BRAZIL SECTION.

RUBBER was an almost exclusively Brazilian production until recent years, when, by the daily increase of its industrial applications, other countries, induced also by the profits derived from it, deemed it advisable to invest large capitals in plantations of the Hevea Braziliensis, obtaining the seeds from the Amazon Valley.

Since this step has been taken the most incongruous opinions have been expressed in regard to that industry in Brazil, it being said in some cases that, unless precautions were taken, the rubber produced would not meet the growing demand, thus causing it to reach still higher prices than it was already obtaining.

Anyone who has been to the States of Para, Amazon, and the Acre Territory, in Brazil, would readily dismiss the simple-mindedness of such an assertion, as the States above-named, with an area of 3,235,436 square kilometres, are covered with the thickest of forests, where the rubber tree is in great excess of any other timber.

Rubber stands now as the second in importance of Brazilian exports, the output and shipments being on the increase from year to year.

The greatest consumer of Brazilian rubber is the United States of America with 16,749,449 kilos in 1906, against 12,422,609 kilos for Great Britain.

It is everybody's knowledge who is interested in rubber that, that from the Amazon and Para is the very best, and cannot be equalled, due to suitable local conditions of soil and climate. It is, besides, clear that, since the Hevea is indigenous of the Amazon forests and its growth, development and yielding properties are dependent of the conditions only to be found in these lands, its adaptation cannot but be followed by detrimental loss in some of its varied qualities. Thus, the rubber to be depended upon for first-class manufactures must perforce be of the class " Para fina," which is the most elastic, impermeable, durable, and in every way reliable.

There are four classified kinds of rubber sent to the markets from Brazil : Fina, Entre-fina, Grossa, and Sernamby ; these apply to the Heveas, of which there are several species.

Besides the Heveas, there are to be found in Brazil several kinds of trees from which rubber is extracted, being noteworthy amongst

them the Mangabeira, Manicoba, and Massaranduba, which, although not so precious and abundant as the Heveas, are, if well treated, of great value, and exported largely to the United States of America and Europe.

It is maintained by rubber experts in the Amazon that, unless the latex is coagulated by the aid of the smoke of certain nuts peculiar to the country, its elasticity is unimpaired; this has to a great extent retarded the application of acids, so much in vogue elsewhere, for the treatment of the latex.

The processes used for tapping and collecting rubber have been the subject of so great controversies for so long, that it is as well to leave to all the belief of supremacy of their methods, and, as everywhere else, opinions vary in Brazil in that respect.

The idea prevails that rubber in Brazil is to be found only on the valley of the Amazon and its tributaries, but not less than fourteen out of the twenty-one States of Brazil either produce it from indigenous forests or from plantations in some of the most enterprising districts.

As late as 1825 rubber is recorded as having been sold at the rate of 4½d. per kilo, and since then the fluctuation of prices have been most astounding, attaining to very high figures and coming down to the present rate.

In view of the multiplicity of uses which rubber is being put to, the interest that is being aroused in its culture in various parts of the world, and the measures which public and private enterprise contemplate to adopt for the furtherance of its development in Brazil, it is not too optimistic to predict that the day is not too remote when rubber will be at the reach of all manufactures for its application with advantage as a substitute to other substances, in several industries which are only waiting that day to spring up with greater vigour.

Rubber is known in Brazil by the names of "Borracha," "Seringa," and "Gomma Elastica." It is attributed to a Catholic missionary its first discovery as used by the aborigines of the Amazon; in 1745; the astronomer La Condamine read a paper, at the Academy of Science in Paris, on the uses of it, showing samples as it was then prepared.

Much has been said against the climate of these parts, but, although the heat is intense and comforts are not to be procured in forests, health and strength can be preserved, and in many cases improved, if the preliminary rules of hygiene, prescribed for such surroundings, are observed.

As in the whole of Brazil, sunstroke is unknown in the Amazon and Para, and the average temperature for any one year is 26°6 (about), the heat being greatly attenuated by breezes and moisture to be expected in a zone where the greatest system of rivers is to be found.

H. H. VASCONCELLOS.

N. H. WITT, ESQ.,

Special Commissioner
for the Chamber of Commerce for
The State of Amazon, at Manaos, Brazil.

THE STATE OF AMAZONAS.

(BRAZIL.)

SIZE.—1,897,000 square kilometers.

POPULATION.—600,000 inhabitants, who nearly all are engaged or in one way or the other connected with the extraction of Rubber or with the Rubber trade.

The vast forest regions along the banks of the Amazon river and its tributaries supply the world with more than half of all the Rubber consumed, a rubber which excels all other kinds by its many useful qualities. Of this enormous Amazon Valley, again the State of Amazonas is the biggest producer of Rubber (the so-called up-river Rubber and Caucho), so that nowadays its very fine capital MANAOS is the largest Rubber centre of the world, as far as producing countries are concerned.

CLIMATE.—According to Wallace ("Travels on the Amazon and Rio Negro"): "The climate of the Amazon Valley seems remarkable for uniformity of temperature and for a regular supply of moisture." Bates, Agassiz, and Maury express in their books the same opinion. The principal tributaries of the Amazon river are very healthy. On many of the smaller affluents, which are now being explored, malaria is not so persistent and decimating as in some parts of Southern Europe. The upper parts of the rivers are rather cooler and healthy.

RUBBER was already known to the Indians, when the Portuguese began to colonise the Amazon Valley. They made water-tight overcoats, shoes, and bags out of the sap of the Hevea Rubber tree, and a lively trade was carried on in these articles. Especially Rubber shoes were in great demand, and in 1840 already more than 300,000 pairs were exported.

Later on, the exportation of Rubber was taken in hand in a more businesslike way, and since about the year 1877 the upper tributaries of the Amazon river—the PURUS, JURUA, and JAVARY—were opened, and Rubber gatherers went up on a large scale. The river MADEIRA, as the first of the big upper tributaries of the Amazon river, had already been colonised before.

In the year 1880 the direct exportation of Rubber from Manaos to Europe and the United States of America began and increased rapidly, as is shown by the following figures:—

Direct exportation of Rubber (including Caucho) via Manaos to consuming markets:—

1880—	374	tons.
1889—	3,255	,,
1900—	8,937	,,
1907—	19,924	,,

THE STATE OF AMAZONAS.

Public Revenue of the State of Amazonas has increased in proportion, it was:—

1852	19,000	Rs.	Brazilian currency.
1882–83	2,502,424	„	„ „
1892–93	6,000,000	„	„ „
1907	14,000,000	„	„ „

The principal affluents of the Amazonas and the Upper Amazonas, called Solimoes, sent down the following quantities during the crop 1907–8.

	Rubber.	Caucho.
Madeira	2,913,884 kilos.	919,552 kilos.
Purus	8,875,970 „	3,297,998 „
Jurua	4,357,926 „	748,393 „
Solimoes	2,328,166 „	313,175 „
Rio Negro ..	596,886 „	1,476 „

All this Rubber is being extracted out of wild-growing forest trees. Rubber plantations are up to now rare, although a beginning in that direction has been made.

The Up-river Rubber (fine, entrefine, scrappy sernamby) is mostly the product of *Hevea brasiliensis* (Muell. Arg.), although there are some of the so far known about 12 different Hevea varieties, which produce also good rubber. The trees are being tapped, and the latex smoked in the well-known style. Some trials to improve on this old system have been made, but could so far not get any footing.

The Rubber known as Rio Negro is the product of Hevea varieties growing on the Rio Negro; Weak Fine, the product of a Hevea species, called "Itauba" (probably *Hevea lutea* var. *cureata Huber*).

Caucho (balls, slab) is the product of a Castilloa species—*Castilloa Ulei Warb*—which grows in nearly all the higher situated forests not subject to yearly inundations.

The Castilloa trees are felled, and the sap is coagulated by admixture of soap, etc., in order to prepare *slabs*. Balls are prepared out of the sap, which is simply dried in the air.

There exist still some other Rubber-producing trees: *Micranda siphonides* (Benth.), *Sapium taburu* (Ule), *Sapium eglandulosum* (Ule), which are, however, so far of little commercial importance.

Apart from Rubber, the State of Amazonas exports Brazil Nuts, Cocoa, Piassava, Balsam Capivi, and some other drugs; its soil is very fertile, and produces pretty well everything that tropical countries can produce. However, rubber gathering being, as a rule, more remunerative, agriculture only takes a secondary place.

Cattle is being raised on the grassy plains in the north of the State.

N. H. Witt, *Commissioner*.

THE STATE OF AMAZONAS.

Exhibit No. 133.

Pavilion erected and exhibits supplied by the **Brazil Chamber of Commerce of the State of the Amazons at Manaos.**

Special Commissioner : N. H. Witt, Esq., of G. A. Witt, Acting Agents, 36, Lime Street, E.C. Offices at the Exhibit.

Fine Rubber produced on the river Acre	1,471	kilos.
,, ,, ,, ,, ,, Jurua	865	,,
,, ,, ,, ,, ,, Solimoes	1,111	,,
,, ,, ,, ,, ,, Alto Purus	500	,,
,, ,, ,, ,, ,, Madeira, including Pelles or Biscuits made in the shape of Knapsacks	202	,,
Fine Rubber produced on the river Madeira	842	,,
Slabby Caucho Ball produced on the river Jamary, and regular Caucho Ball	277	,,
Caucho Ball produced on the river Purus	1,003	,,
,, ,, ,, ,, ,, ,, ...	156	,,
Weak Fine Rubber	205	,,
Fine Rubber produced on the river Purus	1,034	,,
,, ,, ,, ,, ,, Rio Negro	226	,,
,, ,, ,, ,, ,, Jurua	660	,,
Caucho Ball ,, ,, ,, ,, ...	1,000	,,
Fine Rubber produced on the River Javary	350	,,
Sernamby (Negroheads) Rubber produced on the river Rio Negro	20	,,
2 Barrels and ¼ Barrel Sernamby Rubber produced on the river Purus	124	,,

2 Maps of the State of Amazonas, on one of which the places where Rubber is found and collected are marked in colours.

A Set of 8 Photos relating to the collection and preparation of Rubber on the Amazonas.

A Defumador (an original hut as in use on the Amazonas by the natives for smoking Rubber in).

To be Exhibited with the Hut.

1 Biscuit of Fine Rubber with a stick, demonstrating smoking of rubber.
1 Basket of Nuts, used for smoking the rubber.
1 Basin (*bacia*) with 3 sticks of wood.
3 jugs (2 earthen ones, 1 made of fruit peel).
1 jug made of fruit peel (*cuia*).
1 partly prepared Biscuit or Pelle on a stick.
2 Bags of Crude Rubber.
2 Pairs of Rubber Shoes.
1 Hatched for Tapping Rubber Trees.
2 Suits and a Cap, as worn by the rubber makers (*seringueiro*).
2 Hooks (*gatos*).
1 Smoking Apparatus (*boias*).
6 Small Tins or Cups as used for collecting the latex.
3 Spools of Plant Fibre (*cipo*) used for tying up bundles.
1 Knife, with sheath, used by the *seringueiros*.
2 Hook-formed Sticks.

Para (Brazil). A representative, large and choice collection of Rubbers produced in the country, sent by J. Simar da Costa.

1 A Map of the State of Para, showing the distribution of the different Rubber plants and the relative quantity of Rubber produced by the different municipal districts.

---

2 12 Enlarged Photographs, illustrating Rubber Trees cultivated in the Para Botanical Garden, and methods of Rubber gathering on the Amazona.

---

3 A Rubber Knife of Mr. J. Huber's invention, adapted for Para Rubber Trees (Hevea brasiliensis) to be raised instead of the classical "Machadinho."

---

4 Some papers on the Rubber Trees of the Amazons.

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Geographer to His Majesty the King.

THE STATE OF AMAZONAS.

EXHIBITORS.

VISITOR'S NOTES.

Exhibit No. 134.

Federal Government of Brazil, Pavilion.

Various exhibits of Brazilian Rubber will be shown.

Exhibit No. 134a.

Messrs. Mello & Co., of Para and Manaos, Brazil. Agents, Messrs. E. A. DA COSTA & Co., 10–11, Exchange Buildings, Liverpool.

Large biscuit of Fine Para Hard Cure Rubber, weighing 262 kilos., produced in the Upper Jurua River, in one of the estates belonging to and managed by the firm mentioned.

Augusto Ferreira Dias, Para (Brazil).

Pair of Rubber Boots made and worn by the Indians in Rio Yaco, Amazons, Brazil.

As you enter Olympia veer to the right and make for

Exhibit No. 103

OF

"Tropical Life,"

The leading English Journal dealing with the production, preparation and distribution of Tropical and Sub-Tropical products.

The August and September issues will contain articles on—

FUNTUMIA ELASTICA,
CASTILLOA IN MEXICO,
RUBBER AND CACAO IN FIJI,
THE INCREASED DEMAND FOR CHINA TEA,
THE COLOURING ENZYME IN RUBBER,
CASTILLOA IN THE WEST INDIA, &c., &c.

BE SURE AND VISIT EXHIBIT 100, next door to the Exhibit of the Bowman-Northway Tapping Knife, of which we have charge.

"Tropical Life" and the Bowman-Northway Tapping Knife will be pleased to see all friends at their combined Exhibit

Nos. 100 and 103

AT THE

International Rubber Exhibition, at Olympia

From September 14th—26th.

We hope that everyone interested in the scientific tapping, and preparation of Rubber, Hevea, Castilloa, Rambong (Assam), Funtumia, Cacao, &c., will pay us a visit.

Exhibits 100 and 103 are about half-way down the Hall, on the right hand side.

MEXICO.

MEXICO is the third largest Latin-American Republic, and shows every sign of developing her mineral and agricultural resources as rapidly during the next hundred years as her sister Republic, the United States of America, has done during the past century. She can now be said to be entering the adult stage of her existence as regards civilization and industrial development, whilst her emergence from childhood can be dated back to 1857, when her first railway was chartered, and the infant went to school to learn modern ideas. She certainly has made good use of her time. Her willingness to submit to the steady and sagacious rule of a single President for so long, and her wisdom in recognising the sterling qualities of Porfirio Diaz, whilst many of the other Latin-American States are so often seriously disturbed whilst changing theirs, has permanently entitled Mexico to a leading position in American matters.

The Republic plays an important part in the rubber world, as being the home of the Castilloa tree (*Castilloa elastica*), the variety which after Para (*Hevea brasiliensis*) is the most extensively cultivated throughout the world. Although until recently Mexico did not rank very high as a rubber producer, it must be remembered that it was there that in 1525 rubber was originally found by Europeans, who met the natives playing games with balls (similar to the one lent by *Tropical Life* and included in the exhibits) that bounded back from the ground when thrown down. Then, again, those who have studied the question say that Mexico was the first country to take up the question of planting rubber, as, when Matias Romero wrote his paper on rubber culture in 1872, there were already several rubber plantations in existence in the Republic. Among others, José Maria Chacón, as early as 1867, had an estate planted at Zanjón Seco, district of Soconusco, State of Chiapas. To-day there must be some 100,000 acres given up to rubber, representing a capital of nearly £6,000,000 ($60,000,000 Mexican).

In the past, disreputable gamblers brought discredit upon rubber cultivation in Mexico owing to the purely speculative schemes that were launched on a far too trustful public which never troubled to confirm the reports issued about the concerns in which they invested their money. To-day, however, it is agreed on all sides that Mexico can boast of the largest and most carefully cultivated estates of any rubber producing centre, directed by skilled scientists ever ready and anxious to adapt the latest and best methods for planting, tapping, and preparing the rubber. In this way they have, of late years, exported some of the finest rubber produced.

MEXICO SECTION.

With the tendency of late to again take up the "blocking" of rubber, which form, after the first flush of success attained by the Eastern estate, "Lanadron," was expected to make way for pale crêpe (*Hevea*), it is interesting to note that Mexico blocked her Castilloa rubber long ago, realising the advantage of shipping it in this form, as presenting the least possible surface to the atmosphere, which causes the rubber to oxidise and darken.

The money and labour expended in putting forth such fine rubber, has met with the reward that it deserves, for the progress of the industry during the last five years has been phenomenal, as the following statistics show :—

EXPORTS OF RUBBER FROM MEXICO (INCLUDING GUAYULE).

Crop year.		Crop year.	
1902–3	195 tons.	1905–6.. ..	1,450 tons.
1903–4	308 „	1906–7.. ..	4,691 „
1904–5	498 „		

Dr. Pehr Olsson-Seffer, the leading authority on Castilloa Rubber (or Castilla, as he writes it, the tree having been named after the Spanish Botanist, Castillo, who died in 1793, while he was working on the flora of Mexico), addressing the Rubber Planters' Association of Mexico, last October, estimated the world's area of actual rubber plantations to be 355,000 acres, made up as follows :—

Mexico	95,000	Central America ..	14,000
Malay Peninsula ..	92,000	Java	10,000
Ceylon	85,000	India	8,200
Africa	30,000	Brazil	6,000
All others	15,300 acres.		

This estimate is for land actually planted and is based on the number of trees per acre. It does not include those areas that have so far only been "alienated" for rubber.

With the completion of the Tehuantepec National Railway, connecting the Atlantic with the Pacific, and the rapid extension of the iron horse through the chief agricultural and mining centres, the country of Montezuma offers every inducement to those with enterprise and capital to settle there, and in no department does the country offer greater inducements than to those anxious to take up the cultivation of rubber, or rubber-cum-cacao, and rubber-cum-cotton. Whilst the Republic comprises one of the richest and most varied zones in the world, from various causes her resources, which can honestly be described as boundless, have never been properly developed. The almost insatiable home market for cane sugar, corn, beans, fruits, rice, etc., all of which can be grown as subsidiary crops whilst laying out the main plantation, reduces the cost of establishing an estate, and distributes the financial risks to a very large extent.

MEXICO SECTION.

Taken as an ordinary cultivated tree, the Castilloa is as easy a plant to cultivate as any. When tapping, one has to remember that the latex tubes occur in the layer between the cambium and the outer bark, but as they originate in the cambium, and are constantly being added to from this tissue, it is impossible to draw a line of demarcation between these tissues, and so unless the cambium is actually cut into, the maximum yield of latex cannot be obtained. A Castilloa tapping knife to work efficaciously should not only groove the bark of the tree, but be provided with a sharp cutter to penetrate into the cambium itself, and with a clean cut to open the latex tubes they contain without tearing or dragging at them. With a sharp knife and a clean cut, such wounds should heal over within 24 hours, and cause the minimum of injury to the tree.

Until lately, manufacturers complained that Castilloa rubber contained far too large a proportion of resin. At times this was not to be wondered at, when we are told that the percentage varied from 8 to 41 per cent. A new method of preparation has, however, been invented, by which it is claimed that the percentage of resin can be reduced to 3 per cent. and less, and the rubber prepared by this process has been pronounced fully equal to the best hard pure Para. Plans of the machine which, it is claimed, is capable of turning out this high-grade Castilloa is on show at the stall of one of the leading firm of engineers.

Rubber sent by H. E. Levesley.
2 Blocks, dry blocked.
2 Blocks, wet blocked.
4 Tortillas or Biscuits.
2 pieces of crépe or Lace Rubber.
Ball made up of scrap-rubber, similar to those first seen by the Spaniards in the 16th Century. Sent by *Tropical Life*.
Plantation, "La Esperanza," State of Oaxaca, Mexico, owned by The Mexican Rubber Co., Ltd., London.
Rubber prepared by H. E. Levesley, Plantation Manager. Age of trees, 9 years.
Various Photographs of the Esperanza Plantation.

Advice of despatch of a large exhibit for this section has been received, but up to the time of going to press with Catalogue, the goods have not come to hand, nor any particulars as to the nature of the Exhibits.

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WEST INDIAN SECTION.

THOUGH it is only within the last decade that the West Indian Rubber industry was, properly speaking, inaugurated, it has already emerged from the experimental stage, and shipments are being made from more than one colony on a commercial scale. Foremost among the West Indian colonies to embark upon Rubber planting were those represented at this Exhibition, namely, British Guiana, Trinidad, Dominica, and St. Lucia.

As a rubber-producing country, much is likely to be heard in the near future of British Guiana, which, though on the north coast of South America, is generally considered an integral part of our West Indian colonies. The Magnificent Province, as it has, so aptly, been termed, has large tracts of land admirably suited for the growth of Para and Castilloa, and several varieties of *Sapium* are found there which yields satisfactory returns in a shorter space of time than either the Castilloa or the Para trees. Different kinds of rubber are being experimented with by Professor J. B. Harrison, C.M.G., at the Onderneeming Farm School, and have been under observation for some years. The Combined Court of British Guiana has also voted the funds for the upkeep of a rubber Experiment Station in the north-west district. Mention must also be made of Balata (*Mimusops Globosa*), a kind of gutta-percha. This industry was started by Sir Henry Davson and Sir William Haines, the former of whom brought the first sample home in a pill-box. The export has gradually grown until it reached 470,000 lbs. in 1905, 630,000 lbs. in 1906, and 990,000 lbs. last year. It gives employment to many hundreds of the black inhabitants, and is one of the most valuable industries of the colony.

In Trinidad and Tobago rapid progress is being made. The principal kind of rubber cultivated in these two islands is the Central American Rubber (*Castilloa elastica*), which appears to be particularly well suited to local conditions as to soil and climate. Rubber is planted in many localities as a shade tree for cacao, with good results, and it has been shown that the two trees grow well together. The rubber is thus established at a very low cost.

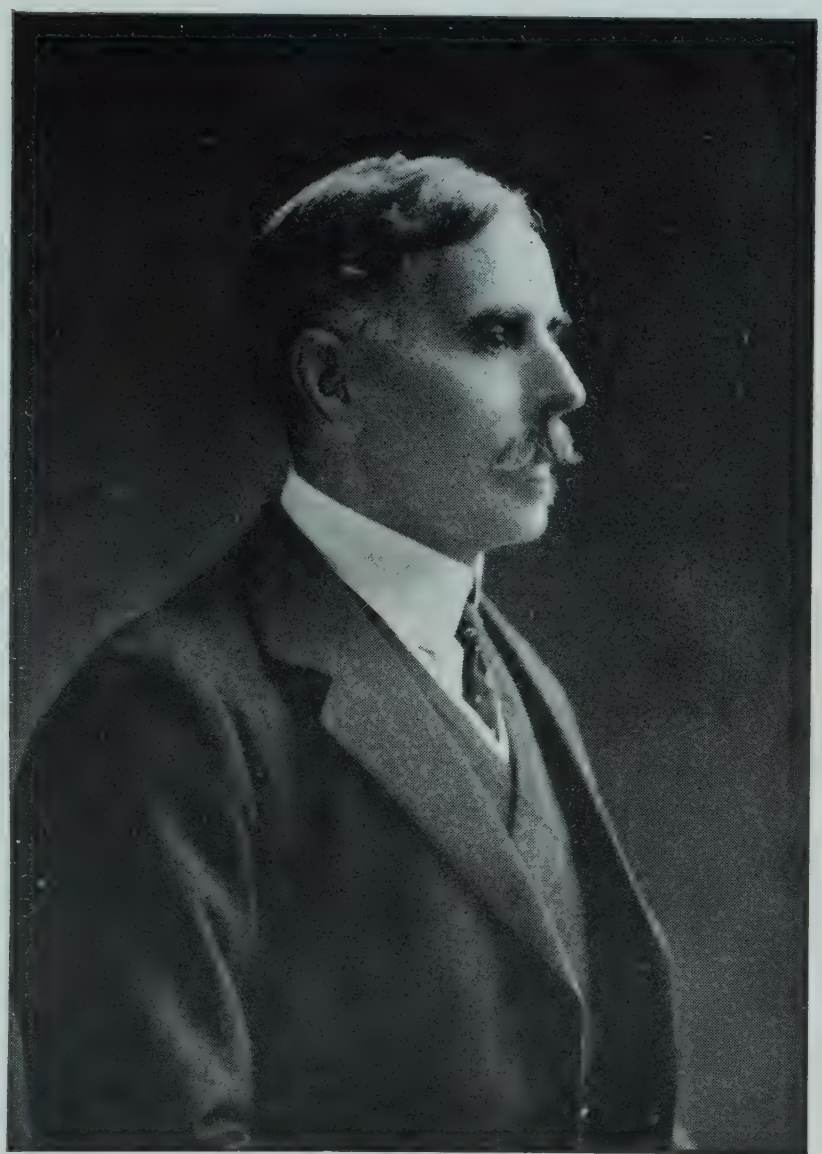
Para Rubber (*Hevea Brasiliensis*) is also cultivated, and the seeds of this variety are in great demand. As indicating the rapid development of the industry, it is worthy of note that the Castilloa tree is rapidly becoming bird sown in all the forest lands in the vicinity of plantations. Mr. J. H. Hart, F.L.S., the late Superintendent of the Botanical Department of Trinidad, who has been largely instrumental in collecting and arranging the exhibits from the colony, has stated that various birds are fond of the succulent fruits, and scatter the seeds to considerable distances.

WEST INDIAN SECTION.

In Dominica—the largest of the Leeward Islands—several of the most productive and best of the rubber-yielding trees thrive well, and they are being successfully cultivated on several estates in the island. *Castilloa elastica* and *Hevea Brasiliensis* are the most popular varieties, but *Funtumia elastica* has also its votaries. With the exception of a bottle of latex of Ceara rubber, and a bottle of latex of *Ficus Vogelii*, which were obtained from trees growing at St. Aroment, the estate of Dr. the Hon. H. A. Alfred Nicholls, C.M.G., the specimens exhibited in the Dominica Section are the products of rubber trees under cultivation at the Botanic Station. Very few of the rubber trees growing on estates in this island have as yet reached the age for tapping, and it was not possible, therefore, for Mr. Joseph Jones, the Secretary of the Permanent Exhibition Committee, to send a large exhibit of plantation rubber. It is hoped that the samples prepared at the Gardens may prove of good quality, and serve to draw attention to the possibilities of rubber cultivation in Dominica.

In St. Lucia also—one of the Windward Islands—the Rubber industry is making headway. The Central American variety is the most popular in the island. At the experiment station of the Imperial Department of Agriculture, trees which have already reached maturity have been tapped with good results.

Within the small compass of this note it is not possible to do more than briefly outline the development in Rubber cultivation which has taken place in recent years. There is an abundance of land in the above-named colonies admirably suited to the production of rubber. The International Rubber Exhibition will serve a useful purpose if it results—as it should do—in calling the attention of capitalists to our colonies in the New World as a suitable field for their operations in the direction of the production of rubber, and in bringing to the notice of the trade and the consumers to the excellence of West Indian Rubber.



SIR DANIEL MORRIS, K.C.M.G., M.A., D.C.L.,
D.Sc.F.L.S., &c., &c.

Imperial Commissioner,
West Indian Agricultural Dept.,
Barbados.

THE BRITISH WEST INDIES.

The exhibits in this section which has been arranged by the West Indian Committee, were prepared by the Permanent Exhibition Committees of the undermentioned colonies.

EXHIBITORS.	VISITOR'S NOTES.
Exhibit No. 45. **DOMINICA.** The Permanent Exhibition Committee of Dominica. Chairman, The Hon. H. A. Alfred Nicholls, C.M.G., M.D. Secretary, Joseph Jones. Flowers of *Funtumia elastica.* Fruits ,, ,, ,, Seeds ,, ,, ,, Seed awns of ,, ,, Seeds of *Castilloa elastica.* Fruits ,, ,, ,, Latex of *Hevea Brasiliensis.* ,, ,, *Castilloa elastica.* ,, ,, *Ficus elastica.* ,, ,, *Manihot Glaziovii.* ,, ,, *Ficus Vogelii.* 12 Small Biscuits of Para Rubber. 3 Large Biscuits of *Castilloa elastica.* 1 Small Biscuit of *Ficus elastica.*	

Exhibit Nos. 46 & 47.

TRINIDAD.

The Permanent Exhibition Committee of Trinidad, Port of Spain, Trinidad. Secretary, Edgar Tripp.

CASTILLOA ELASTICA (*Central American Rubber*). No. 1.—**Block.** No. 2.—**Sheet.** No. 3.—**Scrap.** Exhibited by Heirs of Adrien de Verteuil—Tortuga Estate. Trees 18 to 20 years old.

No. 4.—**Block.** No. 5.—**Biscuit.** No. 6.—**Pressed Sheet Scrap.** Exhibited by Poole District Produce Co., Ltd. Trees 7 to 8 years old. Latex coagulated in water. Biscuits made and pressed by hand.

No. 7.—**Ball Rubber.** Exhibited by H. Monceaux, Monte Cristo Estate. Trees 9 years old, which have been tapped monthly since March, 1906. Samples taken March and April, 1908.

No. 7a.—**Sheet** Exhibited by M. Short, Richmond Estate, Tobago. Trees 15 years old.

WEST INDIAN SECTION.

From Botanical Department, Trinidad (*Prepared by J. Hart, F.L.S., for the Committee.*

No.

8. **Castilloa.**—(21 to 25 years). Latex. Washed, strained. No water added. Hardened in 5 days. Date of tapping, July 31, 1908.
9. **Castilloa.**—(21 to 25 years). Latex. Washed, strained, 5 volumes of water added. Skimmed after 24 hours, another 5 volumes of water added to the cream, again skimmed in 24 hours. Hardened in 3 days. Date of tapping, July 31, 1908.
10. **Castilloa.**—(21 to 25 years). Latex. Washed, strained, 5 volumes of water added. Skimmed after 6 hours. Hardened in 6 days. Date of tapping, August 1, 1908.
11. **Castilloa.**—(21 to 25 years). Latex. Washed, strained, 5 volumes of water added. Skimmed after 6 hours. Hardened in 6 days. Date of tapping, August 1, 1908.
12. **Castilloa.**—(21 to 25 years). Latex. Washed, strained, 5 volumes of water added. Skimmed after 3 hours. Hardened in 6 days. Date of tapping, July 30, 1908.
13. **Castilloa.**—(21 to 25 years). Latex. Washed, strained, 5 volumes of water added. Skimmed after 18 hours. Hardened in 6 days. Date of tapping, August 1, 1908.
14. **Castilloa.**—(21 to 25 years). Latex. Washed, strained, 5 volumes of water added. Skimmed after 18 hours. Hardened in 7 days. Date of tapping, August 1, 1908.
15. **Castilloa.**—(21 to 25 years). Latex. Washed, strained, 5 volumes of water added. Skimmed after 1 hour. Hardened in 9 days. Date of tapping, August 7, 1908.
16. **Castilloa.**—(15 to 18 years). Latex. Washed, strained, no water added. Skimmed after 27 hours. Hardened in 3 days. Date of tapping, August 2, 1908.
17. **Castilloa.**—(21 to 25 years). Latex. Washed, strained, 5 volumes of water added. Skimmed after 2 hours. Another 5 volumes of water added to the cream, again skimmed after 4 hours. Hardened in 7 days. Date of tapping, August 1, 1908.
18. **Castilloa.**—(21 to 25 years). Latex. Washed, strained, 5 volumes of water added. Skimmed after 3 hours. Hardened in 8 days. Date of tapping, July 31, 1908.
19. **Castilloa.**—(21 to 25 years). Latex. Washed, strained. No water added. Hardened in 9 days. Some pressure applied. Date of tapping, July 30, 1908.
20. **Castilloa.**—(21 to 25 years). Latex. Washed, strained. Repeatedly skimmed and diluted with water, in all about 20 volumes. Final skimming after 3 days' rest. Biscuit formed by pressure. Date of tapping, August 1, 1908.
21. **Castilloa.**—(21 to 25 years). Latex. Washed, strained. Repeatedly skimmed and diluted with water, in all about 20 volumes. Final skimming after 4 days' period of rest. The biscuit formed by pressure. Date of tapping, August 1, 1908.
22. **Castilloa.**—(21 to 25 years). Latex. Washed, strained. Repeatedly washed and skimmed during 5 days. A total of about 15 volumes of water added. Hardened into biscuit in 4 days. Date of tapping, August 1, 1908.
23. **Castilloa.**—(21 to 25 years). Latex. Strained, repeatedly washed and skimmed during 5 days. A total of about 15 volumes of water added. Hardened in 6 days. Date of tapping, August 1, 1908.

WEST INDIAN SECTION.

No.

24. **Castilloa.**—(21 to 25 years). Latex. Strained, repeatedly washed and skimmed during 5 days. A total of about 10 volumes of water added. The temperature of the last water reduced by means of ice, which seemingly retarded the coagulation but produced a whiter cream. Biscuit made by pressure after 3 days. Date of tapping, August 1, 1908.

25. **Castilloa.**—(21 to 25 years). Latex. Strained, washed. Repeatedly skimmed and diluted with water, in all about 20 volumes. Final skimming after 4 days. Hardened in 4 days. Date of tapping, August 1, 1908.

26. **Castilloa.**—(21 to 25 years). Latex. Strained, washed. Repeatedly skimmed and diluted with water, in all about 20 volumes. Final skimming after 4 days. Hardened in 4 days. Date of tapping, August 1, 1908.

27. **Castilloa.**—(15 to 18 years). Latex. Washed, strained, 5 volumes of water added. Skimmed after 5 days. Biscuit formed by pressure. Date of tapping, August 3, 1908.

28. **Castilloa.**—(11 years). Latex. Washed, strained, 5 volume latex added. Skimmed after 16 hours. Hardened in about 5 days. Date of tapping, August 11, 1908.

29. **Castilloa.**—(11 years). Latex. Washed, strained, 5 volumes of water added. Skimmed after 16 hours. Hardened in about 5 days. Date of tapping, August 11, 1908.

30. **Castilloa Ball.**—(21 to 25 years). Collected by rolling off the rubber coagulated in the wounds 24 hours after collecting latex for biscuit.

31. **Castilloa Ball.**—(about 12 to 15 years). Collected by rolling off the rubber coagulated in the wounds 24 hours after collecting latex.

32. **Castilloa Ball.**—(about 11 years). Collected by rolling off the rubber coagulated in the wounds 24 hours after collecting flowing latex.

HEVEA BRASILIENSIS (*Para Rubber*). From trees in Botanic Gardens about 35 years old. Diameter of trees at 3 feet above ground equals six feet. Two herring bone incisions 3 feet long with 18 inch branches made with the "Acme" Rubber-tool. The cuts kept open for about two weeks by lightly shaving them with the tool every 48 hours. First flow of latex made into biscuits. After the flow ceased the rubber coagulated in the wounds was collected 24 hours afterwards and rolled into balls. Period of bleeding, July 31 to August 12, 1908.

33. **Biscuit.**—Tree A. Yellow latex. No washing. Latex strained. Hardened in 24 hours.

34. **Biscuit.**—Tree B. White latex. No washing. Latex strained. Hardened in 24 hours.

35. **Biscuit.**—Tree B. White latex. No washing. Latex strained. Hardened in 24 hours.

36. **Ball.**—Tree A. Yellow latex. Collected from cuts 24 hours after taking latex for biscuit.

37. **Ball.**—Tree B. White latex. Collected from cuts 24 hours after taking latex for biscuit.

FUNTUMIA ELASTICA (*West African Rubber*). Trees at St. Clair. Tapped 30th July, 1908. Spiral Tapping.

38. **Biscuit.**—Undiluted latex poured into porus earthenware dishes and permitted to evaporate, assisted by frequent disturbances and punctures of upper film. On the tenth day the coagulated matter was caked by means of pressure and friction, no liquid or residue of any kind remaining; the entire mass on coagulating forming the biscuit which was washed and dried in shade.

WEST INDIAN SECTION.

No.

39. **Ball.**—Collected from cuts after obtaining running latex for seencmpi No. 38, above.

Note.—Trees 10 years old. Trees lightly tapped 3 years previously.

RUBBER FROM FICUS VOGELII, MIQ.

40. **BISCUIT.**—Latex not washed. Coagulated by means of addition 59 per cent. alcohol, period one minute. Pressed into cake, washed with water and dried. When fresh it has a low elasticity. One tree bled 7th August, 1908, by light knife cuts.

41. **Ball.**—Collected from cuts 24 hours after taking latex for biscuit.

LANDOLPHIA (*African Rubber*).

42. **Ball.**—Landolphia Kirkii. Vine 25 years old. Coagulated in cuts at moment of cutting and rolled into ball.

43. **Ball.**—From Landolphia sp. Vine 12 years old. Coagulated in cuts and rolled into ball.

FICUS ELASTICA, ROXB (*Assam Rubber*). From old tree, probably 30 to 40 years old. Tapped by means of light knife cuts. Cuts on secondary trunks gave very little latex; main trunk much richer. Date of tapping August 12, 1908.

44. **Biscuit.**—No washing. No straining. Latex as coming from tree poured into porous dish and pressed into biscuit, less than two hours after tapping.

45. **Ball.**—Collected from cuts 24 hours after taking latex from biscuit.

EXTRA SAMPLES.

46. Sample **Hevea** extracted January, 1905, made into ball, and divided in halves and kept on open shelves in the Tropics since then to August 1908. (Tree A).

47. Similar sample **Hevea** extracted January, 1906. Cut into halves, and kept to date. (Tree A, No. 33).

48. Similar sample extratced January, 1907. (Tree B, No. 34).

49. Sample **Funtumia Elastica Rubber** extracted 1907. Coagulated by boiling and skimming the surface as it coagulated.

Note.—Samples 8 to 49 obtained by natural coagulation, except where otherwise stated. Natural coagulation means, *without chemicals.*

PLANTS FROM BOTANICAL DEPARTMENT.

50. **Hevea Brasiliensis**—Para Rubber.

51. **Funtumia Elastica**—W. African or Silk Rubber.

52. **Castilloa Elastica**—C. American Rubber.

53. **Mimusops**—Balata.

54. **Landolphia Sp.**—African Rubber Vine.

SEEDS.

55. **Selection Rubber Seeds, etc.**

WEST INDIAN SECTION.

EXHIBITORS.

VISITOR'S NOTES.

Exhibit No. 48.

BRITISH GUIANA.

The Permanent Exhibition Committee of British Guiana, Georgetown, Demerara. Secretary, H. Everett Anderson.

Various specimens of Castilloa elastica, Hevea Brasiliensis, different kinds of Sapium and Balata (Mimusops globosa).

Exhibit No. 49.

ST. LUCIA.

The Permanent Exhibition Committee of St. Lucia, Castries, St. Lucia. Hon. E. G. Bennett, Chairman.

Various specimens of Castilloa elastica, Hevea Brasiliensis, &c. as tabulated in a separate catalogue obtainable at the stand.

Enquiries regarding the above Exhibits may be addressed to the Permanent Exhibition Committees direct, or to Algernon E. Aspinall, their representative in London. The West Indian Committee, 15, Seething Lane, E.C.

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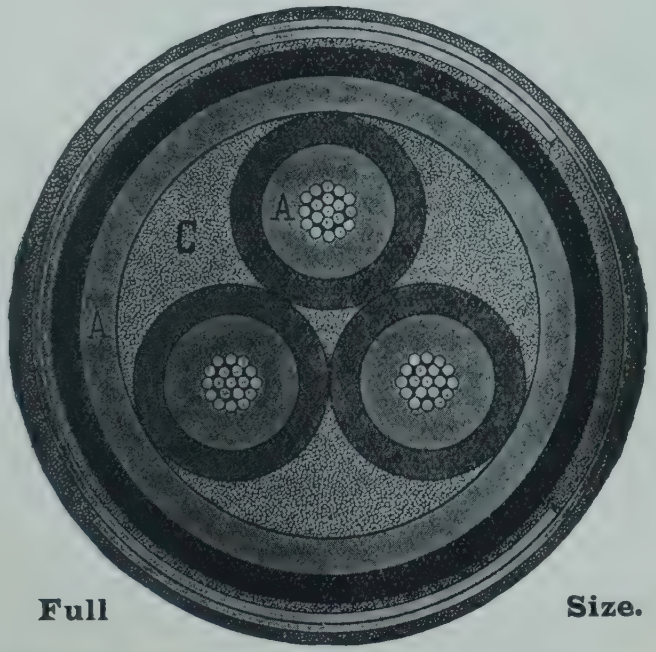

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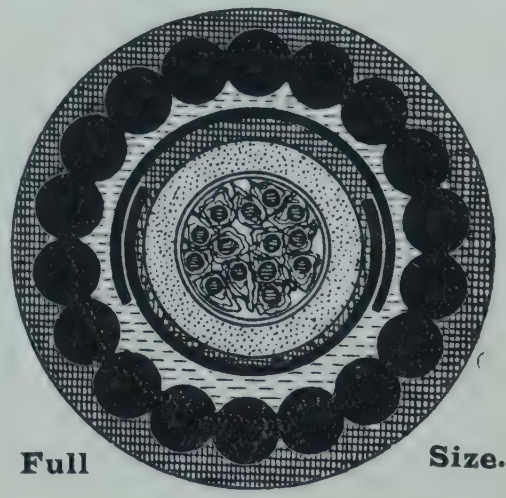

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EXHIBITS.

COMMERCIAL SECTION.

[*The Committee and Manager are not responsible for the description of the Exhibits as printed in this Catalogue as they are all supplied by the Exhibitors.*]

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EXHIBITORS.

VISITOR'S NOTES.

Exhibit No. 1.

A. M. & J. Ferguson, Colombo, Ceylon. London Agents, Messrs. MACLAREN & SONS, India Rubber Journal, 37 & 38, Shoe Lane.

Publishers "Ceylon Observer" (oldest Daily Paper in Ceylon); "Overland Observer" (weekly summary published weekly for despatch by English Mail); Tropical Agriculturist and Magazine of the Ceylon Agricultural Society, the leading journal on Tropical Agriculture, edited by the staff of the Ceylon Royal Botanic Gardens; "Hevea Brasiliensis" or Para Rubber (3rd edition); Science of Para Rubber Cultivation and "Theobroma Cacao" or Cocoa, by Herbert Wright, Ex-controller of the Experiment Station, Botanic Gardens, and Editor (Ceylon Dept.); "Account" of the Ceylon Rubber Exhibition held in September, 1906; Manuals on Tea, Cocoanuts, Fibres, Camphor, Cinchona, Cinnamon, Coffee, Cotton, Pepper, Vanilla, Tobacco, Palms, etc.; Guides and Handbooks to Ceylon and the Ceylon Handbook and Directory (annual). A compendium of useful information regarding Ceylon.

Exhibit No. 2.

The Government and Planters of Ceylon.

For full particulars of exhibits, please *see* Ceylon Section.

Exhibit No. 3.

The Rosehaugh Tea and Rubber Co., Ltd., Ceylon.

Directors :—J. Douglas Fletcher, Esq. (Chairman), W. Nevett, Esq., A. A. Baumann, Esq.

Head Office :—Fortrose, N.B. John Henderson (Secretary).

London Office :—Mincing Lane House, Eastcheap, E.C. A. E. B. Ind (London Secretary).

Ceylon Agents :—Messrs. George Steuart & Co., Colombo.

ESTATES.

Culloden	1,631¼ acres	Ballacadura	413¼ acres
Ellakande	623 ,,	Beredewella	168 ,,
Eduragalla	730¼ ,,	Millawana	1,483 ,,
Godakena	802 ,,	Merria-Cotta	409 ,,
Heatherley	524¼ ,,	Nikakotua	454¾ ,,
Millakande	1,220 ,,	North Pundaloya	870 ,,
Neegama	355½ ,,	Sanquhar	728¼ ,,
Tatipawa	52½ ,,		
		Total Acreage	10,465 ,,

Rubber.—Pressed Crêpe, Loose Crêpe, Biscuits, Block, Scrap Crêpe, Scrap.

Rubber Tree (*Hevea Braziliensis*), showing method of tapping.

Instruments for tapping, Knives and Prickers, and Collecting Cups, etc.

Seed (*Hevea Braziliensis*) Oil from seed and cake.

Photographs, showing tapping operations, curing, washing, drying, and views of plantations, etc.

EXHIBITORS.

VISITOR'S NOTES.

Exhibit Nos: 4, 5, and 6.

The India Rubber, Gutta Percha, and Telegraph Works Co., Ltd., Silvertown, London, E. A most interesting and comprehensive exhibit.

One of the features of the exhibit is "The History of Cycle Tyres," where models of the early solid cord, cushion, single closure and original Dunlop detachable tyres, and "present day" wired-on and beaded-edge tyres are shown.

The evolution of carriage and motor tyres is also shown by models, commencing with the solid clincher grip, and wired-on carriage tyres. In the motor tyre stage there are the "Persan" and the well-known ribbed-tread Palmer cord.

Another "historical" feature is the display of India Rubber matting and floor covering. Around the stand are arranged samples of the plain sheet Rubber matting in use some 50 or 60 years ago, and corrugated and punched mats of all descriptions. The latter development in Rubber tiling (of which this Company were the pioneers), used largely on board ships, in banks, public buildings, etc., is shown in a variety of colours and designs. The outstanding feature of this section, however, is the "Mosaic I. R. Tiling," which the company have just introduced. Several artistic designs are on view, and practically the whole of the floor of the stand is covered with this unique tiling. It has the appearance of marble, and will admirably suit almost any scheme of decoration.

A sample of I. R. Stair Nosing and tread is also on the stand.

There is an exhibit of miscellaneous Rubber goods, including buffers, cord, valves, washers, tubing, hose, bottles, tennis balls, football bladders, etc., and Gutta Percha raw and manufactured. The latest of the Silvertown golf balls—the "Twenty-Five"—is also shown.

An excellent display is made of ebonite goods, containing some large specimens of solid ebonite pumps, cocks, and valves for chemical works.

Under this head will be found a full display of surgical appliances and various styles of fountain pens.

In addition, samples of Rubber and Gutta Percha insulated cables of various kinds are shown.

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EXHIBITORS.

VISITOR'S NOTES.

Exhibit No. 7.

Government of the Gold Coast.

Samples of Trade Rubber as exported from the Gold Coast.

Specimens of the Rubber produced from Funtumia elastica, prepared by various means.

Specimens of the Rubber produced from Ficus Vogelii, prepared by various means.

Specimens of the Rubber produced from Landolphia owariensis, prepared by various means.

Specimens of the Rubber produced from Hevea brasiliensis, prepared by various means.

Exhibit No. 8.

TRAVANCORE-COCHIN EXHIBIT. (SOUTHERN INDIA.)

The Periyar Rubber Co.

1 Box of Rubber.

The Shaliacarry Rubber Co.

Hawthorne Estate,

Sample of high grown Rubber which took the Gold Medal at the Ceylon Rubber Exhibition, 1906, for Southern India Rubber and is grow at an elevation of 3,500 feet.

1 Box of Rubber.

Glenmary Estate, Southern India Tea Estates Co., Ltd.

1 Box of Tea Samples.
1 ,, Cinchona Quills.
1 ,, Stem Bark.
1 ,, Root Bark.

Venture Estate, Peermade.

1 Box of Tea Samples.

Poonmudi Tea Co.

1 Box of Tea Samples.

J. A. Richardson, Esq.

1 Wallum (Native Boat).
1 Cabin Boat.

K. E. Nicoll, Esq.

1 Tin of Cardamon.

EXHIBITORS.

VISITOR'S NOTES.

Aspinwall & Co.—2 Bottles Cocoanut Oil, 1 Bottle Lemon Grass Oil, 1 Tin Pepper, 1 Tin Ginger, 1 Tin Chuck Poonac, 1 Tin Cake Poonac, 1 Tin Nux Vomica, 1 Tin Turmeric, 1 Tin Coprah, 1 Tin Cardamon (marked R), 2 Bunches Paddy, 15 Tins various Paddy, 1 Sample Anjengo Yarn, 1 Sample Aratory Yarn, 1 Sample Machine Yarn, 1 Sample Weaving Yarn, 1 Sample Thick Rope Yarn.

1 SAMPLE OF EACH OF THE FOLLOWING TIMBERS.

Aspinwall & Co. Tea Box Factory, Elavoo.

Aspinwall & Co. Managing Agents, T. T. S. S. Co., Ltd.—Thambagom, Pulla Marudu, Teak, Mango, Red Cedar, White Cedar, Irul, Jack, Ventakk, Vellavaka, Avali, Padri, Kolamavoo, Poon, Vilimbi, Ayini, Ebony, Karamarudu, Kana, Kyitha, Nelli, Jambul, Rosewood, Chadachi, Churli.

Exhibit No. 9.

Particulars not to hand in time for insertion in Catalogue.

Exhibit Nos. 10 & 11.

See Exhibit Nos. 41b and 41c.

Exhibit Nos. 12 & 13.

Exhibits of Rubber Trees, Stumps and Tropical Plants.

Exhibit No. 14.

Werner, Pfleiderer & Perkins, Ltd., Westwood Engineering Works, Peterborough, England.

Machinery for Washing and Masticating Rubber, Gutta Percha and Balata; also for making Rubber Solutions and Doughs and Mixing and Sifting Compounding Materials. Also Mixing and Incorporating Machines for all requirements.

EXHIBITORS.

VISITOR'S NOTES.

Exhibit No. 15.

Exhibit of Rubber Trees, Stumps and Tropical Plants.

Exhibit No. 16.

Francis Shaw & Co., Corbett Street Ironworks, Bradford, Manchester.

Washing and Crêpeing Machines.—A pair of machines as used on rubber plantations for washing and crêpeing crude Rubber. It is first broken up, and all sand and other impurities taken out by passing several times through the machine having diamond-cut rollers. It is then passed through the machine with plain rollers, which completes the cleaning, and produces the rubber sheets in crêpe form, ready for drying.

Hoppers and tanks are fitted under the machines and a small pump, driven from the roller necks, is fixed under each machine, with pipes and valves, so that when the machines are in motion a constant supply of water is ensured, which is fed between the rollers by means of spray pipes on to the Rubber during the washing. The settling tank and strainers keep the water supply free from impurities. The machines are driven by belting, and each machine is controlled by a patent Hele-Shaw friction clutch.

Scott Vacuum Drying Stove.—An apparatus for drying Rubber crêpe, biscuit, or other forms at a low temperature by creating a partial vacuum in the stove. The Rubber is placed on shelves, which are steam heated, but the steam does not come in contact with the Rubber. The door is made to slide, and is secured by means of swing bolts. The vacuum is created by means of a small pump, which can be steam or belt-driven. The moisture driven off is condensed in a surface condenser and trapped in a water receiver. The stove exhibited is the smallest made, and any other sizes can be supplied. They can be also used for drying cocoa, coffee, fruit, chemicals, etc., etc. Rubber is dried very quickly in these stoves, and the coal consumption is very low. Either steam or hot water may be used for heating the chests.

Hydraulic Rubber Blocking Press and Hand Pump.—A double press is exhibited, operated by one-hand pump placed between the two presses, while one press is being charged, the other is pressed and emptied. The boxes into which the Rubber is placed are 9 in. square by 8 in. deep, and the finished blocks are about 9 in. square by 3 in. thick. The top of the boxes are hinged to facilitate charging and emptying. The pump is

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EXHIBITORS.

VISITOR'S NOTES.

operated by a hand lever, and a simple arrangement of valves enables the presses to be worked by native labour. The stand carrying the presses and pump is made in the form of a water-tank, and holds the water by which the machines are operated. The return water from the presses runs back into the tank. The whole machine is thus self-contained, no outside driving power is necessary, and the construction is so simple that it is almost impossible for any parts to get out of order. Single machines are also made on the same principle.

Hydraulic Sheeting Press (12 ft. 6 in. by 4 ft. 4 in.), as used for making rubber sheeting, matting, and other articles in long lengths. The hydraulic rams are four in number, each 18 in. diameter. The top and bottom crossheads are of extra strong design, as also the platten, to prevent any possibility of springing. The chests are cored out for steam, and fitted with steam connections. A draw-plate is placed between the chests for charging and withdrawing the articles being made, and this is operated by means of a rack and pinion. An iron table is provided outside the press to take this draw-plate as it leaves the press.

Hydraulic Press (38 in. square), as used for all descriptions of small moulded Rubber goods. The chests are five in number, giving four working openings, all steam heated for vulcanising the articles. The steam fittings are of our improved design, which do away with leaking joints. These presses are specially adapted for the manufacture of Rubber heels on a large scale.

Waste Rubber Grinding Machine.—This machine has been specially designed for grinding waste Rubber, and is of exceptional strength to enable it to cope with the heaviest class of work. The rollers are of best chilled cast iron, 28 in. long by 16 in. diameter. The caps are of solid forged steel, and the gearing throughout consists of machine-moulded wheels of strong construction.

The frames are fitted with our improved design of safety bush, with steel setting-up screws of great strength. The gearing is arranged to run the rollers at two speeds : a friction speed of 5 to 1 and a friction speed of 2 to 1, the change being effected by means of a double clutch. The machine is motor-driven through double helical machine-cut wheels. A drum type starter is fixed on one side of the machine and an emergency switch above the rollers, so that in case of accident the whole machine can be stopped in a moment by pressing the button. A mechanical scraper is fitted to the back roller, operated from the front by a hand wheel through worm and pinion.

PHOTOGRAPH OF TROPHY,

Presented by
MESSRS. GOW, WILSON & STANTON, LTD.

Exhibit No. 17.

GOW, WILSON & STANTON, Ltd.,

COMPETITION.

Silver Bowl, valued at Twenty-five Guineas.

Copy of letter received :—

13, Rood Lane,
London, 23rd June, 1908.

A. Staines Manders, Esq.,
Manager, International Rubber Exhibition,
75, Chancery Lane, E.C.

Dear Sir,—Feeling confident that the September Exhibition should prove of much practical value to the Rubber Industry generally, we are anxious to further its ends in any way we can.

With this in view, we have much pleasure in informing you that we are prepared to offer a Special Award in the form of a Silver Bowl (value 25 guineas) for the most economical and complete process for preparing Plantation Para Rubber from the Latex, which will give the best and most uniform product on a large scale.

If you think that such a proposal would be acceptable to exhibitors, we shall be glad if you will kindly notify our intention. We will forward you the full conditions, etc., that will have to be complied with by competitors, shortly.

We are, Dear Sir,
Yours faithfully,
for Gow, Wilson and Stanton, Ltd.,
(Signed) PATRICK GOW,
Managing Director.

CONDITIONS.

(1) Judges to be selected by a Committee to be approved by the President of the Exhibition.
(2) A comprehensive and detailed specification of the process or system with sketches of apparatus or machinery employed, must be submitted, and, if possible, a working model of such apparatus or machinery which may be tested with latex, or in any other manner, by the Judges if required.
(3) A sample prepared by this process weighing not less than 25 lbs., exemplifying the claims of the Extrant, must be submitted with the full specification.
(4) No competitor will be eligible unless all the foregoing conditions are complied with.
5) The decision of the Judges on all points shall be final, and no appeal can be allowed.
(6) The Award will not be made unless there are three or more entries.
(7) The Award will not be made unless the Judges are satisfied that the process is practicable, economical, and will give a uniform product on a large scale under Eastern conditions.
(8) That it gives a more uniform quality than that produced by the ordinary processes.

As the entries do not close until 15th September, it is not possible to publish a complete list in this catalogue, but so far the following entries have been received :—

1. J. KELWAY BAMBER, Esq., F.I.C., F.C.S.
(Government Analytical Chemist, Ceylon).

2. SIMOA DA COSTA, Esq.,
Caixa do Correio,
208, Balem do Para, Brazil.

3, MESSRS. MICHIE & GOLLEDGE,
Ceylon.

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1.—**The complete collection of our Journal "Le Caoutchouc et la Gutta-Percha."**

2.—**The "Universal Directory" (in French, English and German) of the Rubber trades and all connected industries.**

3.—**Our Dynamometer P. B. Patented for testing Rubbers, Woven Fabrics, Threads and Wire, Cord, Oilcloth, Linoleum, Celluloid, etc.**

4.—**A new patented apparatus, named "Elastro Durometer" for to know the elasticity of all products, Rubber, Gutta-Percha, Leather, etc., and also to try the hardness of soft products.**

EXHIBITORS.

VISITOR'S NOTES.

Exhibit No. 18.

David Bridge & Co., Engineers and Millwrights, Castleton Ironworks, Castleton, Manchester.

One electrically-driven Washing and Sheeting Machine, with Grooved Rollers, which will be connected and disconnected by means of one of our Heywood & Bridge's Improved Patent Friction Clutches, to show visitors the machine working on all kinds of raw rubber. The machine is only of a medium size ; it will give visitors an idea of the type of machine we manufacture.

Improved Patent Friction Clutch : this will demonstrate how easily Rubber Machinery can be put in and out of gear. We are applying our Clutches to all classes of Rubber Machinery, with our Patent Automatic Disengaging Gear, so that in case of accident the machine can be instantly disconnected. Along with the machine will be fixed the necessary apparatus for heating water, so as to allow rubber to be warmed up if necessary previous to passing through the machine.

After the rubber has passed through this machine, it is next placed in our Improved Vacuum Drier ; after being thoroughly dried in this apparatus, it is again passed through the Sheeting Machine. We show one of these Sheeting Machines with plain rollers ; the rollers are so arranged that they can be heated up with steam and cooled with cold water for the purpose of dealing with some particular kinds of rubber.

Bridge's Patent Rubber Hydraulic Block Presses, with Patent Interchangeable Boxes, which will demonstrate the pressing of washed, sheeted, and dried rubber, and we can clearly show on our stand the handling of the crude rubber to the exportation of same.

We also exhibit an array of Shafting, Pedestals, Hangers, Wheels, Rope and Belt Pulleys, Friction Clutches, various Models, etc., Drying Racks, Trays, Gas Boiler for heating water, Hot Water Tank, and other exhibits interesting to Rubber Manufacturers generally.

One of the most important appliances will be the model that Mr. Da Costa experimented with in Brazil for the coagulation of latex in bulk. This is done by means of the infusion of steam and smoke from palm nuts, native twigs, leaves, etc., into the latex. The question of coagulation amongst the planters is one of the leading topics, and we believe it will be very seriously discussed at the Exhibition. We shall have a case showing some of the Para latex coagulated and manufactured into small articles, together with an independent Rubber Manufacturer's report on same.

It is possible a complete plant will be tested in the yard of the Exhibition.

Telegraphic Address: "SCOTT, NEW MILLS, DERBYSHIRE."

ESTABLISHED 1865.

G. H. SCOTT & CO., Ltd.,

India-Rubber Chemists and Experts.

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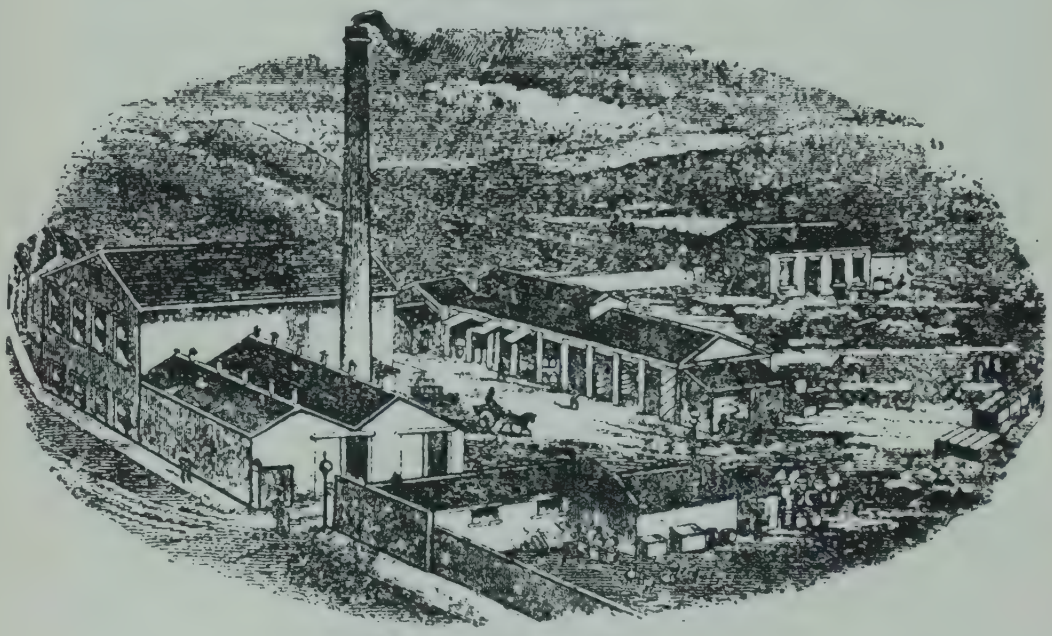

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EXHIBITORS.

VISITOR'S NOTES.

Exhibit No. 19.

"Purub" (Protected by patents) effects within a few hours a perfect separation of the gum contained in the gum-milk in its purest form.

By the exceedingly simple Purub process (see Directions) for which no apparatus whatever are required, there is won a gum which is at once durable and ready for transport and of a much better quality than the gums won by the working methods now in use.

The main advantages of the Purub process are briefly stated the following :

1. All the troublesome and costly methods hitherto in use, such as fumigating, boiling, etc., done away with.
2. Apparatus are not required.
3. Considerable saving of time and money. (The gum does not require to dry and to be stored, it is at once ready for transport.)
4. Saving of packing material and freight. (The gum can be packed in large blocks.)
5. Absolute durability of the gum even if shipped at once in large blocks ; it can be relied on not to deteriorate during the transport or storing.
6. Greatly superior quality of the gum, for which consequently a higher price may be charged.
7. Longer life of the goods made of the raw gum or India rubber won out of Purub.

Exhibit No. 20.

"Lipsia" Chemical Works, Ltd., Muegeln, near Leipzig, Germany. General Agents for England, CHAS. WINDSCHUEGL & CO., 1, Leadenhall Street, London, E.C.

Manufacturers of **Magnesia**—Carbonate and Oxide —light and heavy grades, specially suitable for the manufacture of India Rubber, etc.

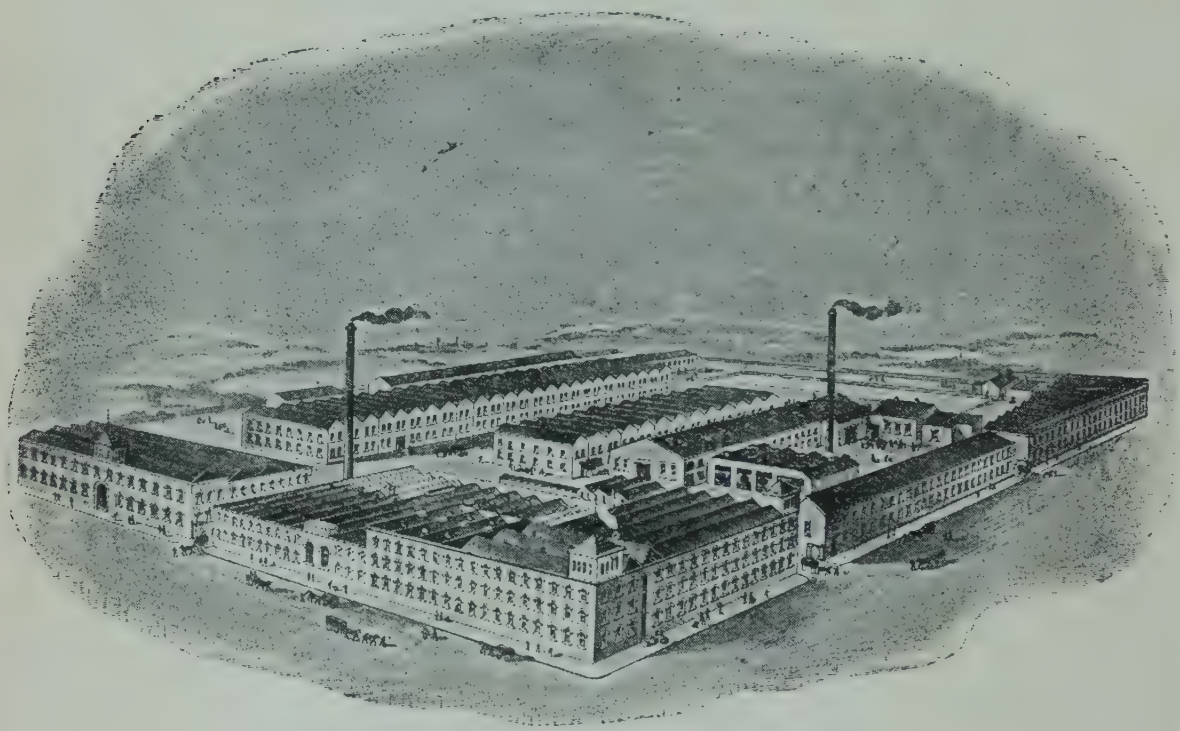
Exhibit No. 21.

Exhibit of Rubber Trees, Stumps and Tropical Plants.

The Leyland & Birmingham Rubber Co., Ltd.

INVITE YOUR ENQUIRIES FOR

ALL CLASSES OF RUBBER GOODS.



Works: Leyland, near Preston.

HOSE.	**SHEET.**	**TUBINGS.**
SURGICALS.	**GARMENTS.**	**GOLF BALLS.**
HEEL PADS.	**ASBESTOS.**	**PIECE GOODS.**
FOOTBALLS.	**&c.**	**&c.**

BRANCHES :

LONDON : 26, 28, 30, Duke Street, Aldgate, E.C.
BIRMINGHAM : 123, 124, New Street.
MANCHESTER : Tower Chambers, 29, Brown St.
GLASGOW : Jas. T. Goudie & Co., 49, Queen St.
EDINBURGH : 25, Princes Street.
JOHANNESBURG : Maxwell Bldgs., Harrison St

EXHIBITORS.

VISITOR'S NOTES.

Exhibit No. 22.

Emil Passburg, Berlin and Erfurt Vacuum Drying and Evaporating Apparatus. Agent, JAMES LIVINGSTON, M.I.MECH.E., M.I.N.A., Merchant & Engineer, 30, Great Saint Helens, London, E.C.

Various samples of Vacuum Dried Washed Rubbers.

Photographs of Passburg Vacuum Drying Chambers with auxiliaries, as supplied to Rubber Plantations in Malay, Ceylon, and Mexico; also to Rubber works. Over 250 Passburg chambers have been supplied for drying Rubber, and it is estimated that over 30,000 tons of washed Rubber are dried per annum in the Passburg chambers.

Exhibit No. 23.

The Praed Patent Safety Gas Light Co., Ltd, 20, Victoria Street, Westminster, London, S.W.

The Praed Patent Safety Gas Light Plant, producing an economical gas for lighting and heating purposes, non-explosive and non-poisonous. The plant is intended for country residences or for industrial uses, and can be operated by any unskilled attendant.

The Praed Patent Safety Gas Plant, producing gas from petrol, vapour, and air, the gas being non-explosive and non-poisonous. The plant can be operated by an unskilled attendant, and the gas serves for illuminating, or for any heating purpose, cooking, etc., at a lower cost than coal gas.

Exhibit No. 24.

Messrs. Walker, Sons & Co., Ltd., Auckland House, 36, Basinghall Street, London, E.C., and at Colombo and Kandy, Ceylon.

Rubber Estate Requisites, Tea and Coffee Machinery Lists, Different types of Tapping Knives, with which practical demonstrations will be given, &c., &c.

Samples of Rubber from the Klanang Produce Co.'s Estate, in "Sheet," "Crepe" and "Worm," also stumps of trees. Photographs of Rubber Estates, Rubber Curing Factories showing the different processes through which Rubber passes, &c., &c.

PIRELLI & CO.,

MILAN, ITALY.

Workmen:—4,500.

Area of Works:—50 Acres.

Manufacturers

of

Electric Wires and Cables.
Submarine Cables.
Mechanical Rubber Goods.
I. R. Hose and Tubing.
I. R. Thread.
Surgical Goods and Sundries.
Ebonite and Gutta Percha Goods.
Rubber Balls.
Water-proof Garments and Cloths
Carriage Tyres.
Motor Tyres and Accessories.
Cycle Tyres and Accessories.

EXHIBITORS.

VISITOR'S NOTES.

Exhibit No. 25.

J. P. William & Brothers, Tropical Seed & Plant Merchants, Heneratogoda, Ceylon.

1 Para Rubber Biscuits, 10lbs.
2 ,, ,, Scrap.
3 Ceara ,, Biscuit.
4 ,, ,, Scrap.
5 Castilloa ,, Biscuit, 2lbs.
6 ,, ,, Scrap.

Biscuits marked Kola.

Para Biscuits marked A coagulated by Citrus Hysterix (tee-cercled Kaffir Lima), marked B with Acetec Acea.

7 Sample Para Scrap.
8 ,, Ceara ,,
9 ,, Castilloa ,,
10 Para Seed, 1 Sample.
11 Ceara ,, ,,
12 Castilloa ,, ,,
13 Funtuma Elastica (silk rubber)
14 1 Sample Parent Tree from Congo Free State Seed.
15 Para Rubber Seed.
16 Castilloa Elassica Seed.
17 Ceara Rubber Seed.
18 Funtumia Elastic Seed.

All Exhibits are from the Kola Estate.

19 Manihot Dichotoma Seed (new).
20 Remenso Seed (old).
21 1 sample Manihot Dichotoma seed (new).
22 1 sample Manihot variety Remenso seed (old).

Exhibit No. 26.

Exhibited by the **Batu Caves Rubber Co., Ltd.,** 10–11, Lime Street, London, E.C.

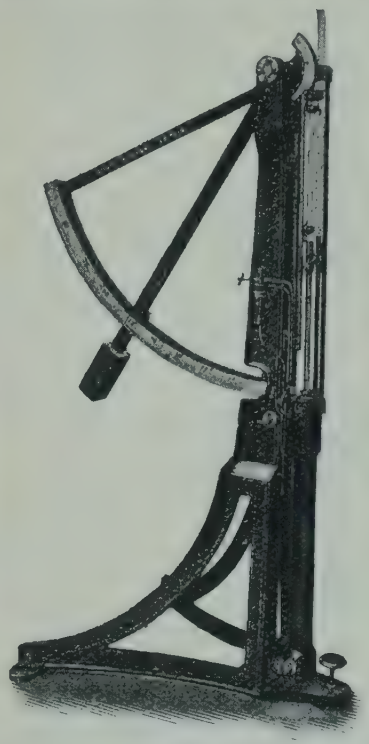
A Board-Room Table covered with Rubber, to demonstrate another use to which Rubber can be put.

Exhibit No. 27.

Trewhella Bros.' Log and Stump Jack. Makers: TREWHELLA BROS., Trentham, Victoria, Australia. Selectors, Timber-Getters & Sawmillers everywhere use these Jacks.

They are light, strong, durable, and the price places them within the reach of all.

Double-purchase Jacks are now fitted with our New Patent Lowering Gear, and Forged Bearings, with Hardened Steel Wearing Surface, without increase of cost.



Schopper's New Rubber Tester

For ascertaining with exactitude the strength and stretch.

A quite new, patented testing method. It has been fully tried and meets most minute requirements.

This machine may be considered to be the most perfect appliance in the world for testing rubber and caoutchouc.

Gauges of Thickness,
Incinerating Apparatus.
All Precision Appliances
For testing web fabrics, yarns, etc.
Chemical-Analytical and
Precision Balances.

LOUIS SCHOPPER,
LEIPZIG, Arndtstrasse 27.

International Rubber and Allied Trades' Exhibition, 1908, London, Olympia, Stand No. 29.

EXHIBITORS.

VISITOR'S NOTES.

Exhibit No. 28.

E. R. & F. Turner, Ltd., Engineers, &c. On Admiralty List. Contractors to the War Office. St. Peter's & Grey Friars Works, Ipswich. London Office: 82, Mark Lane, E.C. Telegrams: "Gippeswyk," Ipswich; "Canvassers," London.

A pair of smooth rolls, 8 inches diameter, 15 inches wide, with end bearings in one casting. The rolls of chilled iron of special quality and deeply chilled.

A cast iron roll, 9 inches diameter, 15 inches wide, deeply chilled and grooved on surface. This roll fixed on turned steel spindle of large diameter, forced into the roll by hydraulic pressure, and provided with a pair of continuous and self-oiling bearings of phosphor bronze in iron carriers.

Specimen of chilled metal broken from roll castings to show depth of chill and quality of metal.

The foregoing rolls as samples only. Any sizes up to 10 inches diameter by 60 inches long, or 18 inches diameter by 30 inches long, can be made to order from specially fine and high-class metal, a special foundry being reserved for this work.

A "John Bull" Vertical Steam Engine, with cylinder 4 inches diameter by 6 inches stroke, with turned steel crankshaft, usual fittings, and with high speed ball governor.

Exhibit Nos. 29 & 30.

Louis Schopper, Leipzig (Germany), Arndtstrasse 27. Maker of precision-mechanical appliances.

The firm is chiefly engaged in the manufacture of apparatus for testing material.

The following machines are displayed at the Exhibition :—

Schopper's New Rubber Tester.—Based on an entirely new patented testing method. By means of this device the limit of elasticity and the weight required in straining the material under test, as well as its stretch and strength in general, can be ascertained with absolute certainty in figures. The test body is ring-shaped.

The machine works by water, and is provided with a Marten's return valve, and can be connected to any water pipe of about 3 atmospheres pressure. It is furnished with the latest improvements recently made on the Schopper testers.

Its manipulation is extremely simple.

The **Cutting-Press** and the **Vulcanising Matrix** serve for preparing the test bodies.

Schopper's Strength Testing Machine for ascertaining strength and stretch of *web fabrics*, to work by electromotor.

The machine allows the test of strips between the clamps up to 16 in. long and 2 in. wide.

The electromotor is directly connected with the testing machine, and turns to the right and left so as to drive the spindle fitted with the clamp for holding the test material up or down.

Cutting Machine for making the test strips.

DERMATINE.

VALVES.

Hard, for Direct Lift.

Flexible, for Curved Guard.

Belting.

Buffers.

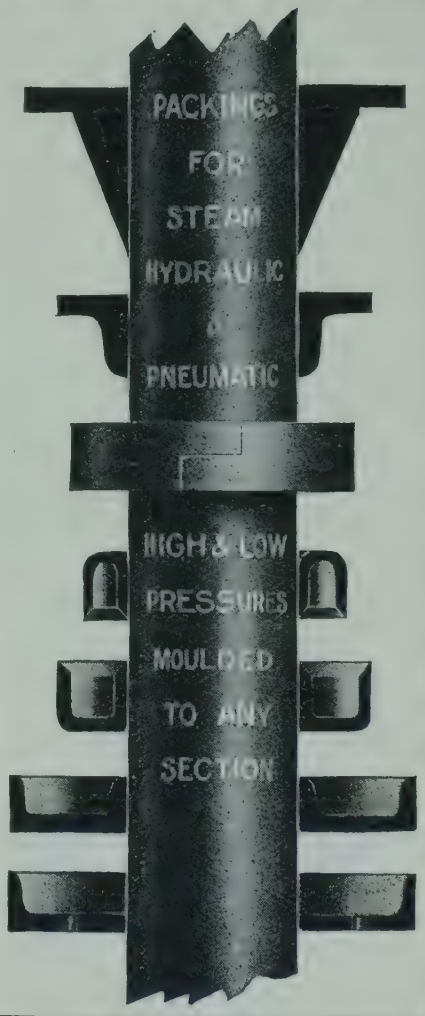
Packings.

Tyres.

Friction Cones.

Telegraphic Address:

"DERMATINE, LONDON."



Steam Hose.

Delivery Hose.

Suction Hose.

Oil Hose.

Acid Hose.

Fire Hose.

Rock Drill Hose.

Acid Tubing.

Hot Wax Tubing.

Gas Tubing.

Steam Joints of all kinds.

Tap Washers.

Valve Seats.

Telephone No.

31 HOP.

DERMATINE is specially stipulated for by the British, French, German, Austrian, Russian, Belgian and Danish Governments; the Chief Corporations and Municipalities throughout Great Britain, the Continent, and the Colonies; also the Chief Engineers and Chemical Manufacturers throughout the World.

Note well the Registered Trade Mark and Name "DERMATINE." Anyone using these will be proceeded against.

MANUFACTURED ONLY BY THE

DERMATINE COMPANY, Limited,

95, Neate Street, LONDON, S.E., Eng.

Commercial Section.

Schopper's Strength Testing Machine, for ascertaining strength and stretch of *yarns, cords, etc.*, to work by water-power.

Schopper's Twist Tester for ascertaining the amount of twist in single or twined yarns.

Schopper's Accurate Thread Counter (*Patented*) for ascertaining the number of threads contained in a certain space of woven material. The most reliable thread counter in existence.

Schopper's Thickness Gauge " Automatic."—This ingenious apparatus registers automatically, with mathematical precision, the thickness of every description of caoutchouc, rubber, web fabrics, felt, paper, cardboard, etc.

Schopper's Incinerating Apparatus " Rapid " for determining the earthy ingredients of rubber. The ash residue is weighed on the *Ash-Balance*. From the weight of ash, the percentage of mineral matter is easily calculated.

Schopper's Quadrant Balance for determining the weight per square metre, yards, etc., of web fabrics, felt, etc.

Chemical-analytical Balance, with circular beams. Very rapid, reliable work may be performed with this balance by reason of its unique construction. Sensitiveness of the balance, one-tenth milligram.

Exhibit Nos. 31 & 32.

Vermorel's Ruapsach Sprayer. Sole Agents for Great Britain, Ireland and the Colonies : CHARLES CLARK & Co., 16A, Bevis Marks, St. Mary Axe, London, E.C.

Has won over 500 First Prizes and Medals. Over one million sold. The following machines are being shown :

" Eclair " No. 1.
Set of Bamboo Lances.
" Tarpille " No. 1.
" Tarpille " Double Action.
" Cascade."

EXHIBITORS.

VISITOR'S NOTES.

Exhibit Nos. 33 & 34.

J. Robinson & Co., Salford. Designers and Makers of India Rubber and Gutta Percha Machinery : Washers, Mixers, Calenders, Presses, Spreading Machines, Fine-cut Sheet Machines, Leather, Cloth, and Table Baize Machines.

No. 3 and No. 4 Size of Washing Mills, belt-driven, for use on Plantations. Machine parts : Rollers for macerating and producing Crêpe and Sheet Rubber, double helical wheels and pedestals.

Exhibit No. 35.

The Northern Rubber Co., Retford, Notts.

General rubber goods for Mechanical purposes, Waterproof goods, Leatherite jointing (Sole Manufacturers).

PAUL ALTMANN

Scientific Instrument Maker,

BERLIN, N.W.

LUISENSTRASSE 47.

SPECIALITIES:

All Apparatus for Rubber Researches.

Complete Furnishing and Enlarging of Laboratories for Technical Chemistry.

Own Workshops and Glass-blowing Works.

All Apparatus for

CHEMISTRY, BACTERIOLOGY, HYGIENE.

Commercial Section.

Exhibit No. 36.

Collective Exhibition of a Laboratory for the scientific and Technical India Rubber researches under the direction of Co-exhibitors. Chemical Laboratory for Commerce and Industry. Proprietors: Dr. Rob. Henriques, Succ., Dr. Eduard Marckwald, and Dr. Fritz Frank.

(*a*) Laboratory Installations, Instruments and Apparatuses, Paul Altmann, Berlin, Luisenstr, 47.

(*b*) Optic Instruments, Ernst Leitz, Wetzlar. Optic works, 9–15, Oxford Street, London, W.

(*c*) Electrical Measuring Apparatuses, Gans and Goldschmidt, Berlin, N., Chausseestrasse.

(*d*) India Rubber Roller, Joseph Robinson and Co., Salford, Manchester.

(*e*) Stoneware.

(*f*) Gas and Water Fittings.

The space is divided into special working rooms, and provided with the most important implements for technical and scientific work.

(1) The Physical Laboratory :
Optic Instruments (Leitz, Wetzlar).
Case with Microscopic Instruments.
Mikrotom.
Magnifying Glass.
Microscope, with complete Optical Installation in connection with Opac-Illuminator.
Large Microscope, with fittings, connected with dark field condensor.
Refractometer (Schmidt and Haensch).
Polarisation Apparatus (Altmann).
Scales, etc. (Altmann), may also mean "carriage," transl.
Chemical Scale, with Weights.
Special Scale for specific determination of weights.
1 Exsiccator.
Pyknometer and normal measuring vessels.
Araeometer.
Apparatus Menikes (specific weight after the swimming method).
Barometer.
Viscosimeter for Oil (Engles).
Viscosimeter after Axelrod for India Rubber dissolving.
Hygrometer (Schublehre F. F. Schultz, Leipzig-Stolleritz).
Inflammation-point Apparatus.
Apparatus for determination of the melting-point of the alloy materials.
Apparatus for measuring the thickness. (Schopper).
Mechanical Testing Apparatus. (Special exhibition, Schopper Stand, No. 29).
Apparatus for measuring isolations with an even and alternative current. Precision Electro Dynamometer. Mirrorgalvanoscope. Sensitiveness 1 mm deflection with 1, scale interspace—1 hundredth milimeter Amp. (Gans and Goldschmidt).

(2) Manufactory space :
Cylinder for Laboratory requirements (Robinson).
Screwpress.
Vulcanisation-boiler after Frank-Marckwald.
Vulcanisating-forms, after Frank-Marckwald.
Laboratory steam-boiler with over-heater.
Globural Mill with electric working.
Centrifugal Apparatus with electric working.
Shaking-apparatus with motor-working.

WM. WARNE & Co., LTD.

Amsterdam, 1869.

India-Rubber Manufacturers.

Amsterdam, 1883.

PATENTEES OF THE

MAGNETIC-CUT INDIA-RUBBER THREAD

IN COMPLETE WARPS.

Red Mineralized India-Rubber

For Valves, Washers, and Hose for Tropical Climates, etc.

THE NEW PATENT SAFETY FILLING WATER BOTTLE

NEW MOULDED SEAMLESS HOSE.

The New Moulded Enemas. The Marvellous Tooth Brush.

Vienna, 1873.

TRADE MARKS.

PATENT MINERALIZED

London, 1885.

The "Hand Emollient," and "Sultan's" Bath Brush.

The "Prince of Wales," "Omnium Gatherum," "Mineralized Corrugated," "Sultan,' "Premier," and "Crocodile" Tobacco Pouches.

ROYAL AROMATIC ELASTIC & IMPERIAL BANDS

Manufacturers of

EVERY DESCRIPTION OF INDIA-RUBBER,

Sheets, Valves, Washers, Buffers, Cord, India-Rubber and Canvas Packing.

DELIVERY AND SUCTION HOSE PIPES
FOR FIRE ENGINES, STEAM PACKETS, etc.

Gas Tubing, Lawn Tennis Balls, Enemas, Syringes, Catheters, Water Beds, etc.
THE ARMY AND NAVY REGULATION COATS AND CLOAKS

Piece Goods, Cart and Wagon Covers, Air-Proof Beds,
Cushions, etc. Solid India-Rubber Mats and Matting.

Paris, 1867.

29, Gresham Street, London, E.C.

WORKS:

Tottenham and Barking.

London 1862.

Commercial Section.

(3) Chemical Laboratory :

Burning furnace with all fittings.

Shooting furnace complete.

Extraction Apparatus for 6 extractions, after Frank-Marckwald.

Extraction Apparatus for 3 extractions, with different apparatuses.

Autoclave for opening India Rubber wares, after Frank-Marckwald.

Hand Centrifugal Apparatus.

Water Baths.

Reagenturo bottles, funnel for partition, Filter from Dreverhoff.

Steam pot with over-heater, after Lassar Cohn.

Drying Cabinet, with regulator for 100°.

Drying Cabinet, with regulator for 140°.

Drying Cabinet for heating liquids.

Exsiccators.

Apparatus for determination of sulphur, after :
Henriques,
Alexander (Pancock Morton).
Eschka.
Grafe.

Apparatus for direct determination of India Rubber (Axelrod Model), by Frank-Marckwald.

Apparatus for direct determination of India Rubber, after Alexander.

Apparatus for determination of nitrogen for 1 sample,

Apparatus for titration with all fittings.

Apparatus for determination of the boiling-scale for business use.

Apparatus for gas developing, by Kipp.

Incineration Hearth for 6 basins.

Water-jet Blast Apparatuses.

Water-jet Pumps.

Laboratory Scale.

Laboratory Instruments, Glass, Porcelain, Metal.

Exhibit Nos. 37 & 38.

See the Straits Settlements and Federated Malay States Section.

EXHIBITORS.	VISITOR'S NOTES.
Exhibit No. 39.	
Mabira Forest (Uganda) Rubber Co., Ltd., 46, Leadenhall Street, London, E.C.	
1 Sample of Crêpe and Corrugated Sheet Rubber.	
2 Sample red soil—Mabira Forest.	
3 Sample black surface soil—Mabira Forest.	
4 Sample Funtumia Elastica Latex.	
5 Photographs—Mabira Forest.	

Telephone: HOLBORN, 847. Telegrams: "EQUANIMOUS, LONDON."

THOMAS BALSHAW,

Manufacturers' Agent,

III, FARRINGDON ROAD, LONDON, E.C.

India Rubber. Asbestos.
Ebonite. Gutta Percha.

Official Representative in the United Kingdom for the following:

GUMMIFABRIK WESTEND, G.m.b.H., BERLIN, Manufacturers of Ebonite, Sheets, Rods and Tubes, and Moulded Pieces of every description for the Electrical and Engineering Trades.

OTTO DILLNER, LEIPZIG, Manufacturers of Seamless India Rubber Goods of all kinds, Fine Cut Sheet Tubing, Transparent Teats, Ice Bags, Sponge Bags, Bathing Caps, etc.

NEUMANN & BOECLER, HAMBURG, Manufacturers of Asbestos Millboard, Yarns, Cloth, Plaited Packings, Asbestos Rubber Sheet, Rubber Insertion Sheeting, and all kinds of Packings.

JOSEF REITHOFFER'S SONS, VIENNA, Manufacturers of Reithoffer's Pneumatic Tyres for Automobiles, Cycles, etc., Solid Rubber Tyres for Motor Busses and heavy Vehicles, Cab Tyres, Reithoffer's Hospital-and-Bed-Sheeting "Paracelsus Cambric," etc.

HANSEATIC VULKANFIBER CO., G.m.b.H., HAMBURG, Manufacturers of Vulcanized Fibre in Sheets, Rods and Tubes, and shaped articles of every description.

PROMPT DELIVERIES FROM LONDON STOCK.

See Stands 110 and 110a.

EXHIBITORS.

VISITOR'S NOTES.

Exhibit No. 40.

Rubber is one of the principal products of British East Africa, the annual value of the export during recent years being about £20,000.

It is obtained mainly by native collectors from various rubber-yielding creepers or rubber vines, which occur in abundance in many parts of the country. Of these rubber vines, the most important is *Landolphia Kirkii*, which is widely distributed over the eastern side of the continent, and in British East Africa is very common in the wet coastal regions, and along the sides of rivers in the drier districts.

An interesting addition to the native rubber plants of the country is the tree yielding Mgoa Rubber (*Mascarenhasia elastica*), which recently was found to occur in the Shimba Hills.

Experimental work in introducing rubber trees from other parts of the world has been actively prosecuted by the Agricultural Department and by planters, and the Para rubber tree (*Hevea brasiliensis*), the Ceara rubber (*Manihot Glaziovii*), the Central American rubber (*Castilloa elastica*) have all been introduced, as well as the Lagos Silk Rubber (*Funtumia elastica*), formerly thought to be confined to West Africa, but recently found to occur also in the wild state in Uganda.

Exhibit No. 41.

London & India Docks Company, Dock House, 109, Leadenhall Street, London, E.C.

Four photographs, viz. :—

1.—Vault : Sampling Plantation and Borneo Rubber.

2.—Second Floor : Weighing Penang and sampling bags Mozambique Rubber.

3.—Vault : Sorting Bags Central American Rubber.

4.—Exterior of Rubber and Gutta Percha Warehouse.

In the London and India Docks Company's vaults and warehouses is stored a large proportion of the india rubber and gutta percha imported into London.

The premises set apart for this business are situated in the St. Katharine Dock, and are close to the offices of the principal brokers and merchants in the City.

Consignments of india rubber and gutta percha for which orders are received are collected by the Docks Company from the vessels immediately on arrival, and conveyed to the warehouse to be weighed, sampled, etc. From thence they are removed to the vaults.

These vaults are particularly well adapted for the storage of india rubber and gutta percha, owing to their low and even temperature.

Ebonite.

Dr. HEINR. TRAUN & SONS

Works :—**Hamburg, Harburg & New York.**

London House and Sole Agency for United Kingdom and the Colonies:—

8, REDCROSS STREET, LONDON, E.C.

F. WINTER, Manager.

Telephone: 3186 Central. Telegrams: INSTANTLY, LONDON.

Specialists in Ebonite. (Vulcanite.)

Number of hands over 2,000. Established 52 years.

Vulcanite.

Societe Anonime des Anciens Etablissements.

J. B. TORRILHON,

Chamalieres (P-d-D), FRANCE.

Industrial Articles. Cycle Accessories.

Pneumatic Tyres for Motors.

Solid American B. & S. Tyres.

M.L. Torrilhon Blocks for heavy-weight Motors.

Water-proof Garments. Galoshes and Rubber Boots.

PARIS ADDRESS :—

10, Faubourg Poissonniere.

Commercial Section.

Exhibit No. 41a.

The Booth Steamship Co., Ltd., 30, James Street, Liverpool; and Adelphi Terrace House, 11, Adelphi Terrace, Strand, W.C.

Framed reproduction of picture by Mr. Norman Wilkinson, showing a Booth Liner at Sea.
Framed reproduction of picture by Mr. Norman Wilkinson, showing a Booth Liner at Sea. Another view.
Framed photograph of the R.M.S. *Antony* at sea. (Twin-screw, 6,400 tons.)
Framed photographic view showing Royal Palace Hotel, Bussaco (Portugal).
Framed photograph of view at Leiria (Portugal).
Framed water-colour drawing of Cintra (Portugal), by Mr. Stanley Inchbold.
Framed water-colour drawing of Monta Estoril (Portugal), by Mr. Stanley Inchbold.
One frame containing reproductions of water-colour drawings, by A. S. Forrest, showing views in Portugal.

See also Exhibit 135B.

EXHIBITORS.

VISITOR'S NOTES.

Exhibit No. 41b.

Messrs. Gow, Wilson & Stanton, Ltd., Rubber Brokers, of 13, Rood Lane, E.C.

A series of three diagrams published by them :—

Centre of Screen.

(1) Illustrating the chemical contents of all grades of Para Rubber, both the South American product and the Eastern Plantation kinds.

Left-hand Side of Screen.

(2) Showing the comparative amount of Rubber produced in Ceylon and Malaya during the last three years.

Right-hand Side of Screen.

(3) The production of British-grown Rubber as compared with that of South American Para for a period of three years ending 1907, showing the relative quantities from Ceylon and Malaya.

The analyses on which the first diagram is based were carried out in Messrs. Gow, Wilson & Stanton's laboratory.

Exhibit No. 41c.

Bull Wharf & Warehouse, Queenhithe, London, E.C.

Photographs of Bull Wharf, Queenhithe, Sampling Rubber, &c., &c.

FINEST . .
QUALITY .

GUAYULE.

Unequalled in Strength, Purity and Elasticity by any other Guayule.

. . Low percentage of Resin. . .

Made of "Parra" Guayule, washed dry ready for use. A Boon to small Factories, not having Vacuum Dryers.

FOR PARTICULARS SEE EXHIBIT.

E. D. MAURER,

97, Water Street,

NEW YORK.

EXHIBITORS.

VISITOR'S NOTES.

Exhibit No. 41d.

Hay's Wharf & Dock and Cotton's Wharf, Southwark, S.E.

A series of Photographs.

1.—Shewing general river front view of Hay's, Cotton's, Fenning's & Willson's Wharves, all in the occupation of The Proprietors of Hay's Wharf, Limited.

2.—Method of landing packages of India Rubber from steamer at Cotton's Wharf.

3.—View of floor in one of the warehouses in Cotton's Wharf in which India Rubber is dealt with before being brought to sale.

4.—Corner in one of the delivery yards of Cotton's Wharf, and India Rubber in process of delivery from Storage.

Exhibit No. 42.

Lieut.-Col. W. Wyllie, Rangoon, Burma, India.

1 Wardian Case containing plants of "Talaing-sok" (*Parameria glandulifera*) and "Kyet-poung" (*Chavannesia* or *Urceola esculenta*), two rubber yielding creepers indigenous to Burma.

Para Rubber.

1 rectangular cake
1 rounded ,,
3 biscuits
5 balls and 1 flake scrap
a lot of rubber trimmings

Cearr Rubber.

1 biscuit and 2 cakes

Chavannesia (Urceola) Rubber.

1 biscuit and a cake

Exhibit No. 43.

Adamson, Gilfillan & Co., Ltd., London, Singapore and Penang, 2, Billiter Avenue, London, E.C.

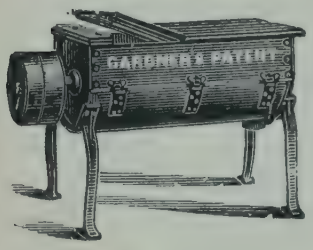
Hill's Patent Tapping Knife.

A Patent Tapping Knife. Sharp Knives at lowest possible cost, necessary to renew blades only.

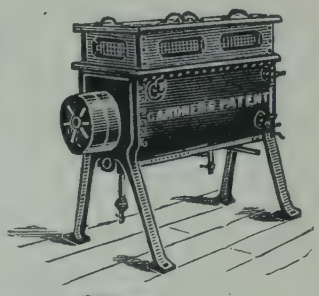
Minimum injury to Cambium.

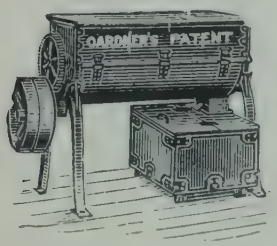
Prices for quantities on application.
Patent Rights for sale.
The sample Knives to be sold at 3/6 each.
Descriptive Booklet—1d. each.

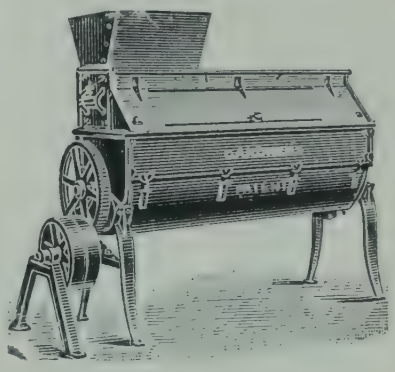
GARDNER'S PATENT "RAPID" SIFTERS.
GARDNER'S PATENT "RAPID" MIXERS.
GARDNER'S PATENT "RAPID" DRYERS.



Made in many styles and sizes for perfectly treating all kinds of Powders used in the India Rubber trades.







Catalogues free from :—

WM. GARDNER & SONS, GLOUCESTER LTD.

Powder Machine Specialists, **GLOUCESTER.**

Established 1837.

THOMAS GLOVER & SON,

CARLTON.

NOTTINGHAM.

Manufacturers of all kinds of made-up Rubber Goods.

Elastic Stockings, etc.,

Elastic Webbings & Bandages,

Covered Rubber Cord.

EXHIBITORS.

VISITOR'S NOTES.

Exhibit No. 44.

P. E. Delofond, Engineer, P.O. Box 1288, Mexico City.

A Sample guayule with resin obtained by a new process, which enables one to obtain a quality equal or similar to Para. The process causes the Rubber not to alter, and renders it absolutely pure.

Exhibit No. 45.

DOMINICA.

(*See* West Indian Section).

Exhibit Nos. 46 & 47.

TRINIDAD.

(*See* West Indian Section).

Exhibit No. 48.

BRITISH GUIANA.

(*See* West Indian Section.

Exhibit No. 49.

ST. LUCIA.

(*See* West Indian Section.)

Exhibit No. 50.

(*See* West Indian Section.)

Exhibit No. 51.

Rubber Plantations, Ltd., 20, Copthall Avenue, London, E.C.

Rubber Biscuits from Dangan Estate, Ceylon. Samples of Cocoa Beans and Pods, &c.

Exhibit No. 52.

Alexander David Callander, Neboda Group, Neboda, Ceylon. Agents, COMMERCIAL INTELLIGENCE BUREAU, 57-58, Holborn Viaduct, London, E.C.

An improved instrument, complete in itself and of simple construction, for grooving and tapping Rubber trees, in order to obtain a flow of latex. This knife makes the incision, and pares off the skin of the tree at a single stroke. The depth of the groove is regulated by a semi-circular guide, while the two side edges determine the width. Price, 4s. each.

KUHN & Co.

18, DUKE ST.,
ALDGATE, E.C.

RECLAIMED RUBBERS. =

Quality and Uniformity Guaranteed.

SAMPLES SENT ON APPLICATION.

HEAD OFFICE: 31, LOMBARD STREET, E.C.

EXHIBITORS.

VISITOR'S NOTES.

Exhibit No. 53.

Exhibit No. 54.

See West Indies Section.

Exhibit No. 55.

Addressograph, Ltd., 91-2, Shoe Lane, London, E.C.

Addressing Machines capable of addressing 2,000 different envelopes, wrappers, or the like, in one hour, each with a different address, and the work fac-simile of Typewriting. Also used for Heading and Dating Invoices and Statements, filling in Dividend Warrants, Wages Sheets, &c.

Exhibit No. 56.

"Venesta," Ltd., 20, Eastcheap, London, E.C.

"Venesta" 3-ply Cases for packing Rubber and Rubber Goods.

Exhibit Nos. 57 & 58.

Netherlands Gutta Percha Co., Ltd., Singapore, Straits Settlements.

Rubber Goods, Tyres, Hose, Buffers, etc.
Raw Rubber, Crepe, Block Rubber.
Leaf Gutta Percha extracted by mechanical process.

Exhibits Nos. 59 & 60.

Diespeker, Ltd., 57-60, Holborn Viaduct, E.C. Sole Selling agents for the United Kingdom and the Isle of Man for the Dunlop Company's Rubber Tiles.

Dunlop Rubber Tiling, shown as applied to a model bath room, making a perfectly clean, sanitary, and non-slipping floor of artistic appearance, attractive to the eye and pleasant to walk upon, not being cold or harsh like encaustic tiles or marble.

Also shown suitable for ordinary floors of liners, yachts, railway carriages, churches, hospitals, asylums, banks, hotels and mansions, and public and private buildings of all kinds. It is particularly suitable for halls and corridors, being the only really perfectly silent floor, and, besides being unbreakable, is durable, economical, and easily cleaned.

The right hand portion of the exhibit displays inlaid lettering and ornamentation, demonstrating the applicability of Dunlop Rubber Tiling to neat and effective advertising display. This would also be a very suitable style for entrance halls to railway stations, restaurants, showrooms, and shops.

F. AUSTEN,

Practical Exhibition Fitter,

Sign and Banner Maker,

Opposite Goods Entrance Olympia.

BY APPOINTMENT TO THE ORGANISER BUSINESS EXHIBITION. . . . . .

STANLEY SHOW EXHIBITION.
GROCERS ,,
BAKERS & CONFECTIONERS ,,
MOTOR CAR ACCESSORIES ,,
BUILDING TRADES ,,
CLOTHIERS ,,
MINING ,,
BREWERS ,,
ETC., ETC.

12, Maclise Road, KENSINGTON, W.

Telephone : **4202 WESTERN.**

EXHIBITORS.

VISITOR'S NOTES.

Exhibit No. 61.

Huttenbach & Co., 4, Fenchurch Avenue, London, E.C., representing Huttenbach Bros. & Co., Penang and Singapore; Huttenbach & Co., Deli Sumatra, Batu Kawan and Prye Estates, Province Wellesley, etc., etc.

Raw Gutta Percha and India Rubber from the Straits Settlements and Malay Peninsula.

Exhibit No. 61a.

Tangyes, Ltd., Cornwall Works, Birmingham. (HUTTENBACH BROS. & Co., Penang and Singapore, Agents for Straits Settlements and neighbourhood.)

One "F.S." (10 B.H.P.) Tangye "Suction" Gas Engine, fitted with Magneto-Electric Ignition Gear and Variable Timing Device, instead of tube ignition, and run on "Suction" Gas supplied by a "B" size Tangye "Suction" Gas Producer.

One "E.O." (9½ B.H.P.) Tangye Oil Engine, with flywheel and pulley complete, fitted with water injection arrangement and automatic igniter.

One 6 in. by 8 in. Tangye Vertical Three-throw Ram Pump, suitable for working against "heads" up to 300 ft., and capable of delivering about 5,760 English gallons of water per hour.

One No. 5 Tangye New Pattern Low Lift Centrifugal Pump, fitted with one standard and one pulley, capable of delivering about 24,000 English gallons of water per hour.

One 9 in. by 13 in. Tangye Long-stroke Vertical Steam Engine, constructed for steam pressures not exceeding 100 lbs. per square inch, and controlled by Tangye's "Quick-speed" Governor.

Exhibit No. 61b.

Fleming, Birkby & Goodall, Ltd., 39, Lime Street, London, E.C. Works at Halifax, Liversedge, Brighouse, and Fleetwood. (HUTTENBACH BROS. & Co., Penang and Singapore, Agents for Straits Settlements and neighbourhood.)

The machinery in motion on this Stand is driven by "TEON" Belting.

The "TEON" BELT, a high grade Vulcanised Textile Belting for power transmission, manufactured from the finest super Cotton Duck, folded into plies, and cemented with a secret cement, which does not deteriorate in the same way as with Rubber Belting.

Seamless Rubber Goods,

Teats, Preservatives, Operation Stones,
Finger Cots, &c.

Transparent Teats,

Also Transparent Tubings.

Sponge Bags,

Also Bathing Caps, Ice Bags, &c.,
Made from Check Sheeting.

Moustache Trainers,
India-Rubber Sponges.

STAND 110.

OTTO DILLNER,

India-Rubber Manufacturer,

LEIPZIG, GERMANY.

London Office and Warehouse :
111, FARRINGDON ROAD, E.C.

Manager, THOMAS BALSHAW,

Telephone : 847 Holborn. Telegrams : "EQUANIMOUS," London.

EXHIBITORS.

VISITOR'S NOTES.

The Belt is especially calculated to withstand extremes of *heat or cold*, being unaffected by either; it is also a perfectly *Waterproof* Belting, and so made as to be practically stretchless, specially suited for the extreme climatic conditions existing in the Colonies.

Exhibit No. 61c.

Bergtheil & Young, 12, Camomile Street, London, E.C. (HUTTENBACH BROS. & Co., Penang and Singapore, Agents for Straits Settlements and neighbourhood.)

"BANDY" Electric Punkahs.
One 4 ft. 6 in. ordinary shore type.
One 2 ft. 6 in. domestic type.
For use on direct or alternating current, solving all difficulties experienced with the hand-pulled Punkah, and avoiding its faults while maintaining and improving upon all its salient features.
Also made for use on board ship, in railway carriages, etc., etc.

Exhibit No. 62.

See Mexico Section.

Exhibit No. 63 & 64.

"Prowodnik" Reclaimed.

Reclaimed Russian Goloshes, manufactured by The "Prowodnik" Co., Riga, Russia, otherwise The Russian-French India-Rubber, Gutta Percha & Telegraph Works.

Selling Agents:

EDM. SCHLUTER & Co., JOHN LANG, London and Liverpool.

Exhibit No. 65.

Loan Exhibits.

Exhibit No. 66.

For particulars *see* Exhibit Nos. 41 and 41a.

GENUINE PURE RUBBER SPONGES.

Light and durable.

Quality and Prices right.

We also MANUFACTURE Vulcanite Combs, Surgical Appliances, I.R. Balls, Toys and Dolls, Sundry Articles of every description in hard or soft rubber.

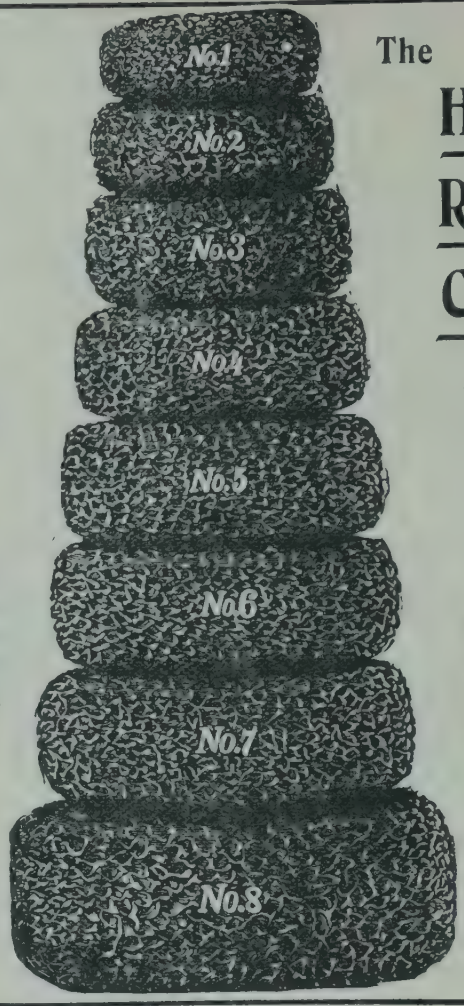
Gutta Percha Goods.

Tissue.

Douche Tubing.

Etc., etc.

Motor and Cycle Tyres.



The . .

HANOVER = RUBBER = COMPANY,

Hannoversche Gummi-Kamm-Co., Act.-Ges.

Office and Warehouse:

No. 29-31, Old St., London, E.C.

ENQUIRIES SOLICITED.

Own Make.

Stock kept in London.

NORDDEUTSCHE SEEKABELWERKE A.G., NORDENHAM ON WESER, GERMANY,

Manufacturers of **GUTTA-PERCHA** For all purposes.

GOLF BALL GUTTA. WASHED BALATA.
CHATTERTON'S COMPOUND.

For Samples and Quotations apply to the Sole Agent for the United Kingdom :—

OTTO PHILIPPSON,

65, Fenchurch Street, London, E.C.

Telegraphic Address—"Philomot, London."

Commercial Section.

Exhibit Nos. 67 & 68.

The Brazilian Rubber Trust Ltd., Alderman's House, Alderman's Walk, Bishopsgate Without, London, E.C.

The exhibit of the Brazilian Rubber Trust, Ltd., will be found to the left of, and near, the main entrance to the exhibition from Addison Road Station. It comprises native-cured specimens of Fine Islands Para Rubber from the Company's Estates, and some excellent photographs of forest-grown Para Rubber trees (*Hevea brasiliensis*), and of the methods of tapping, smoking or curing, cutting and packing Para Rubber. Specimens of the paddles on which the Rubber is cured and of the tapping axes employed by the natives are also shown in the exhibit. The following particulars of the Company are appended :

Capital : £37,500. Situation of Estates : Anajas, Island of Marajo, State of Para, Brazil. Area : 284 square miles, or considerably over 150,000 acres. Average annual production of Para Rubber (5 years) : 129 metric tons, or 284,316 lbs. Average annual value of crop at London prices :(5 years) : £62,233.

Directors : John Ormiston Lawson-Johnston, William Perfect Lapage, Eustace Collet Brown, and Ashmore Russan. Secretary : Edward Freeling Johnston.

Special notice.—With a view to increasing the already considerable production from the forests on its estate and to the establishment, in addition, of extensive plantations, the Brazilian Rubber Trust, Ltd., is now being reorganised with the object of providing the working capital necessary for such increase and plantations. Particulars may be obtained from the Secretary as above.

The Brazilian Rubber Trust, Ltd., acquired its estates in 1901 from the pioneer English Company owning forests of Para Rubber on the Amazon. The Directors have, consequently, had many years experience of the working of such properties in Brazil.

The world's production of Rubber. This is about 70,000 tons. It is not generally recognised that of the above large quantity, Brazil and the rest of South America produce about 60 per cent., or, say, 42,000 tons.

The State of Para, where this company's properties are situated, is, of course, the original home of the Para Rubber tree, and, consequently, of Para Rubber.

The average production of the State of Para for the past five years has been 14,340 tons per annum.

The average production for the past five years of the Islands District alone of the State of Para (in which, as above stated, the company's properties are situated) has been 9,880 tons per annum.

EXHIBITORS.	VISITOR'S NOTES.
Exhibit No. 69.	
Loan Exhibits.	

EXHIBITORS.

VISITOR'S NOTES.

Exhibit Nos. 70 & 71.

The Tella Camera Co., 68, High Holborn, W.C.

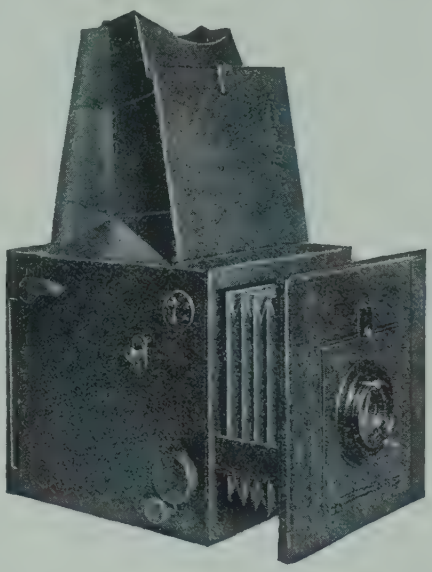
Official Photographers to this Exhibition; have the sole right to take photographs.

Skilled operators in attendance at our stand throughout the Exhibition.

We have every facility for delivering photographs quickly.

Half-tone and line blocks a speciality.

We are also showing the new Tella Reflex Camera, of which we are the manufacturers. The two striking features of this camera are its extreme lightness and smallness. The quarter-plate size complete with lens weighs 2½ lbs., thus being less than half the weight of any other reflex camera made. There is a full size finder at the top of the camera, enabling the full size image to be seen right up to the exact second of exposure. The camera is fitted with focal plane shutter giving varying speeds from 1/5th to 1/1000th second. The illustration shows the camera with hood up and front partly extended. The prices of the camera complete with focussing screen, and six dark slides, are as follows:



¼ plate.	5 by 4.	Postcard.	½ plate.
£10 10 0	£15 0 0	£15 0 0	£21 0 0

Full particulars of the camera are given in "The Book of the Tella Reflex," which can be had at our stand, or will be sent post free on application.

Exhibit No. 72.

"Our Dumb Friends' League," 118, Victoria Street, London, S.W.

Horse Ambulance, presented to "Our Dumb Friends' League" (a Society for the Encouragement of Kindness to Animals) by the Earl of Lonsdale. The Ambulance is supported by voluntary contributions.

EXHIBITORS.

VISITOR'S NOTES.

Exhibit No. 73.

The American Register, Paris and London. Founded 1868. The largest circulation of any Anglo-American newspaper in Europe. 32, Piccadilly Circus, London; Flat Iron Building, New York; 8, Place de L'Opera, Paris—our reception rooms at the three centres of civilization. The only American newspaper published in England. American, English, and Colonial travellers are welcomed at the offices of "The American Register," where information as to the best shops, hotels, travel information, etc., will be given them free of charge. Telegrams: "Ameregis, London"; "Ameregis, Paris." The oldest English newspaper on the Continent.

"The American Register" will be on sale at this stall daily during the Exhibition. It is published every Saturday, price 1d.

Exhibit No. 74.

Irwell & Eastern Rubber Co., Ltd., Mill Street, Salford, Manchester. City Office: 4, Lloyds Avenue, Fenchurch Street, E.C. Warehouses: Tidal Basin, Victoria Docks, London, E.; 25, Hope Street, Glasgow; 58, Queen Street, Hull.

Lanco Balata Belting, with and without cover, and general Mechanical Goods. 36 in. Balata Conveyor Belt; also two endless belts; samples of Balata Belting with Jackson fasteners attached. "Colsell's H.P. Packing," "Cab Tyres," "Values," etc. Roll of cotton duck as received from manufacturer, to show class of duck used for Lanco Balata Belting. 3 Balata animals which were found in a block of Balata made by the natives. Photographs of various Balata Belting; also cards showing different thicknesses of Balata Belting from 3 to 10 ply.

EXHIBITORS.

VISITOR'S NOTES.

Exhibit No. 75.

Typke & King, Ltd., 16, Mincing Lane, London, E.C.

Chemicals, Colours, India Rubber Substitutes and all Ingredients used in the Manufacture of India Rubber Goods, also specimens of India Rubber Goods in which the same have been employed.

Antimony, Golden Sulphuret special.
Barytes.
Black Hypo.
Black Pigment.
Brown Powder.
Cadmium, Yellow.
Carbon Tetrachloride.
Chalk Precipitated.
Compound No. 1.
Compound No. 2.
Crimson Sulphuret.
Crimson Sulphuret Brilliant.
Crimson Sulphuret Special.
Electric Facing.
French Chalk.
Green Pigment Brilliant.
Green Pigment.
Antimony Metal.
Antimony Crude.
Antimony Oxide.
India Rubber Substitute Special.
India Rubber Substitute S.O.
India Rubber Substitute Snow.
India Rubber Substitute Dark "Para Anglais."
India Rubber Substitute Dark Ordinary.
India Rubber Substitute Dark "Parateka."
India Rubber Substitute Snow White and Black.
India Rubber Substitute Amber, Lump.
India Rubber Substitute Spongy, Crimson.
India Rubber Substitute Spongy, Orange.
India Rubber Substitute Spongy, Yellow.
Lamp Black.
Lead, Red.
Litharge Powder, pure.
Lime, pure.
Lithopone, A.
Magnesia, Calcined, lightest.
Magnesia, pure, finest light.
Metallic Sulphur.
Plumbagine.
Red Pigment, Special for hot and cold cure.
Scarlet Stain.
Sol Compound.
Sulphur, Chloride, specially prepared.
Sulphur, pure Precipitated.
Sulphur, very fine quality.
Vegetable Extra, specially prepared.
Vegetable Black Extra.
Vermilion, deep or pale.
Vermilion Extra.
Sublimed Lead.
Yellow Pigment.
Zinc, Oxide, finest.
Zinc, Sulphide, White or Straw Colour.

EXHIBITORS.

VISITOR'S NOTES.

Exhibit Nos. 76 & 77.

Exhibit No. 78.

The British Murac Syndicate, Ltd., Lower Edmonton, London, N.; Laboratory, 33-35, Old Street, London, E.C.

Pure Murac and products.

Exhibit No. 79.

Forster & Gregory, Lonesome Chemical Works, Streatham Common, London, S.W.

Samples of the colouring materials and vulcanising and preserving agents used in the manufacture of India Rubber Goods, and some of the results of their application to these purposes.

Exhibit No. 80.

Salter Typewriter Co., 40, Holborn Viaduct, E.C. Head Office and Works, West Bromwich. Branch offices in all large towns. Telephone, London: 1925 Holborn.

LATEST MODEL SALTER STANDARD TYPEWRITERS.

Only Standard Writing Machine made in Great Britain, price £16 16s. With Brief carriage £2 2s. extra.

The new Model No. 7 Machine and its equivalent Brief are fitted with the latest improvements, and have a specially patented device rendering the alignment perfect. The Machine is a visible writer, very strong and durable, simple of construction and adjustment, has automatic and adjustable margin stops, and margin release, twin ribbon, is universally acknowledged to be the best stencil cutter and carbon manifolder.

The stencil-cutting properties of the Machine will be demonstrated in conjunction with the Duplicator.

The Machine is manufactured by Messrs. George Salter & Co., the well-known Spring Balance Makers of West Bromwich, and is the outcome of some 15 years very careful study and experimenting.

You rent a telephone, why not rent a Typewriter? We are prepared to quote exceptional hire terms to responsible firms.

EXHIBITORS.

VISITOR'S NOTES.

Exhibit No. 81.

John Bright & Bro., Ltd., Rochdale.

COTTON DUCKS for Motor Tyres, Cycle Tyres, Balata Belting, Rubber Belting, Sewn Belting, Rubber Packing, Rubber Hose, Canvas Shoes, Filter Presses, Tents and Awnings, Sailcloth, Mechanical purposes, Hair Belting, Cotton Belting, Elevator Belting.

Exhibit No. 82.

Exposition of Guayule by ED. MAURER, 97' Water Street, New York, representing:

Compania Explotadora Coahuilense, S. A., Parras, Coah. Mexico; 2 factories, capacity 5 tons daily.
Salvador Madero & Co., S. e. C., San Tiburcio, Mexico; 1 factory, capacity 3 tons daily.
Compania Ganadera de la Merced, Torreon, Mexico; capacity 1 ton daily.
Fabrica de Hule Australia; Cuatro Cienegas, Mexico; capacity 1 ton daily.
Fabrica de la Delicias, San Pedro, Coah. Mexico; capacity 1 ton daily.

Makers of the celebrated PARRA brand Guayule.

Also exhibiting finished goods made entirely or in part of PARRA brand Guayule.
Also showing deresined Guayule and combinations with other rubbers made with deresined and crude Guayule.

DURANGO cured, washed and dried ready for use.

Guayule.
Also exhibiting Guayule Plants from which the rubber is made.

Exhibit No. 83.

The New Motor & General Rubber Co., Ltd., Rub-Metal Mills, Harpenden.

The well-known R.M. Rubber Compounds in various grades, shown in bulk, also in small quantities packed in tins.
R.M. Vulcanising Cement.
Egyptian and American Cotton Ducks, proofed and unproofed, in several designs and weights, specially woven for Pneumatic Tyres and other purposes.
Masticated Rubbers. Heel Pads. Air Pump and Circulating Valves. Washers. Packing Rings. Steel Studs for non-skids, etc., etc.

John Bright & Brothers

Limited

Rochdale.

Bicycle

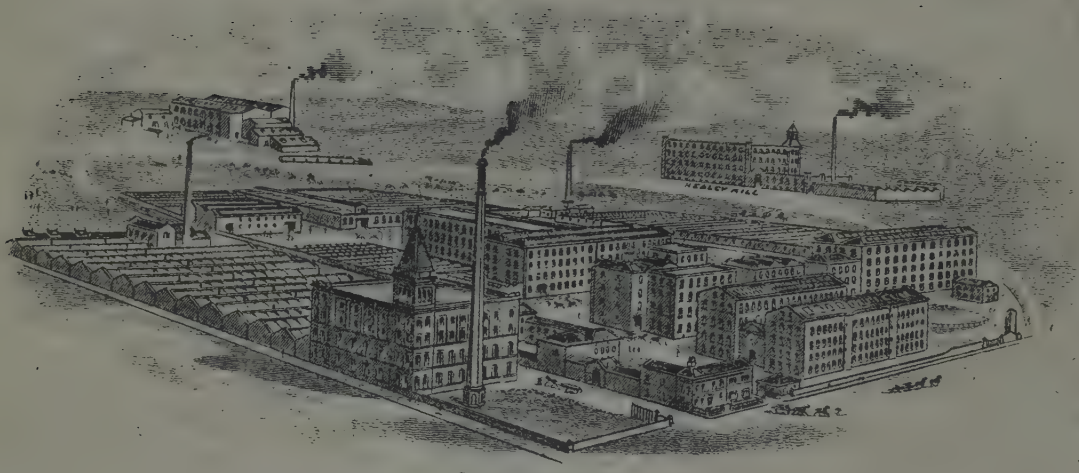
Tyre

Fabrics.

Motor

Tyre

Ducks.



FIELDHOUSE MILLS.

EXHIBITORS.

VISITOR'S NOTES.

Exhibit No. 84.

The Northwestern Rubber Co., Litherland, near Liverpool,

Are exhibiting samples of the reclaimed rubber manufactured by them under the Marks patents (involving the use of dilute alkali solutions at high temperatures).

The Company has now had six years' experience in the British and Continental Markets, and the stocks now exhibited represent an enormous outlay of thought and expenditure in the attempt to produce reclaimed rubber capable of meeting the most exacting demands of the manufacturer as to strength, cleanness and uniformity.

The works are the largest and most complete in Europe, the buildings having a floor area of over 100,000 square feet. The machinery is the best that experience can suggest, much of it having been especially designed and adapted. The most formidable problem the reclaimer has to face is the production of a really clean, smooth stock for insulating or proofing work. This has been accomplished by the use of special machinery chosen as the best after unwearied experimenting with many different types ; and the stocks to-day are as clean as it is possible to make. The brands "Motos," "Alta," "Argo" and "Eagle" are known to all rubber goods manufacturers, and are extensively used in mechanical goods, boots, shoes, as well as in proofing and insulating.

Dr. Torrey, General Superintendent, of the manufacturing department, is one of the best known chemists in the rubber world, besides being an expert in reclaimed rubber factory management.

Mr. Ernest E. Buckleton, General Manager, who controls the executive and selling department, is well known to all European rubber manufacturers, and is a practical manufacturer of considerable experience.

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Exhibit No. 85.

India Rubber World. Published on the 1st of every month by The India Rubber Publishing Co., No. 395, Broadway, New York. An Illustrated Review of the Rubber and Allied Trades. Edited by Henry C. Pearson.

The "India Rubber World" bases its claim to the support of the rubber industry and trade on the ground that its effort ever has been to render them a definite service ; and whatever measure of support has rewarded its management has been looked upon as a recognition by its patrons of

a service rendered. The like trade journal is not content merely to keep going; its aim should be rather to prove so useful that the business interests which it represents cannot do without it.

Terms of Subscription: In the United States, Three Dollars per year, in advance, prepaid. Abroad, $3.50 (gold)—14 shillings 7 pence—francs 18.25—marks 15—or equivalent funds. Advertising rates on application.

BOOKS FOR RUBBER MEN. By Henry C. Pearson:

Crude Rubber and Compounding Ingredients. Price, $10.00.

What I Saw in the Tropics. Price, $3.00.

Rubber Tyres and All About Them. Price, $3.00.

The Rubber Trade Directory for 1908. Price, $3.00.

The India Rubber Publishing Co., No. 395, Broadway, New York.

Exhibit No. 86.

The Crosskeys Manufacturing Co., Crosskeys House, 56, Moorgate Street, London, E.C.

Glossine.—A Solution for protecting Rubber from oxidation and for waterproofing leather, giving at the same time a bright polished appearance to the goods.

Endurite.—A Waterproof Cement for fastening rubber to rubber, rubber to leather, and leather to leather; and any of these to fabrics generally.

Newit.—Waterproof invisible boot soles and patches.

Exhibit No. 87.

Photographs and Plantation Rubber Exhibits.

Exhibit No. 88.

A Rubber Mat (circular) which has been in constant use for 35 years; kindly exhibited by The Liverpool Rubber Co., Vauxhall Road, Liverpool.

Exhibit No. 89.

Alfred Smith, Excelsior Works, Clayton, Manchester, and at 21, Addle Street, London, E.C.

A complete range of Black and Drab Reclaimed Rubbers, which include special qualities for Proofing, and Mechanical Goods. White, Amber, and Dark India Rubber Substitutes (lump or ground) for Proofing or Mechanical Goods, and among other specialities the following:—

Prepared Lime.
Ultramarine Colours.
Carbonate of Magnesia.
Calcined Magnesia.
Flowers of Sulphur.
India Rubber Black.

And all Chemicals used in the India Rubber Industry.

EXHIBITORS.

VISITOR'S NOTES.

Exhibit No. 89a.

The India Rubber Manufacturing Co., Bank Street, Clayton, Manchester, and at 21, Addle Street, Wood Street, London, E.C.

The following qualities of Rubber Heels :—
"Luna" Revolving Rubber Heels.
"Juno" ,, ,, ,,
"Don" ,, ,, ,,
"Jupiter" ,, ,, ,,
"Don" Quarter Heel Tips.
"Rock" Standard Shaped Heels.
"Rock" Superfine ,, ,,
Any quality or pattern can be made to suit shippers or other firms' requirements.
Advertising novelties for export.

Exhibit No. 90.

"The India Rubber Journal." Editor : HERBERT WRIGHT, F.L.S., Assoc. R.C.S. The only British Journal devoted to the Rubber Industry—Planting, Manufacturing, and Retail Published fortnightly.

Technical Works for Rubber men, Estate Report Sheets, etc.
Reception and Rest Room for readers and advertisers.
Exhibit of Apparatus for testing rubber, lent by Mr. Herbert Wright and Dr. Schidrowitz, as follows :—

1. Physical Apparatus used in Rubber Work.

Nos.
1. Delaloe Breaking Strain Apparatus.
2. Schidrowitz Tensile Strength Apparatus—direct weight pull.
3. ,, ,, ,, ,, —horizontal pull.
4. Mould Press and Plate Press (small).
5. "Between Plates" Pressure Apparatus.
6. Small tools (punches, micrometer gauge, etc.).
7. Set of Standard Thermometers.
8. Mercury Pump (vacuum).
9. Automatic Gas Regulator and Reducing Valve.
10. Redwood's Viscometer.
11. Capillary Viscometer (Ostwald-Schidrowitz).
12. Flash Point Apparatus.
13. Refractometer.
14. Research Miscroscope.
15. Photographic Miscroscope.
16. Freezing Microtome.

2. Chemical Apparatus used in Rubber Work.

17. Experimental Vulcaniser, with automatic gas control heating.
18. Vulcaniser Moulds.
19. Chemical Balance.
20. Tube Water Bath for heating and evacuating at same time, with Ditmar-Schidrowitz glass tube with ground joints.
21. Water Bath, with set of Schidrowitz Apparatus. Drying Flask for same.
22. Gas Analysis Apparatus.
23. Special Rubber articles used in chemical work.
24. Quartz (silica) Laboratory Apparatus.
25. Drawings of experimental Rubber Washing and Mixing Machines.

EXHIBITORS.

VISITOR'S NOTES.

Exhibit No. 91.

Robert Warner & Co., Ltd., Engineers, 97, Queen Victoria Street, London, E.C. Works: Walton-on-the-Naze.

RUBBER PLANTATION MACHINERY.

1. **Macerating or Crêpe Machine,** for treating back or coagulated latex, with 8 in. by 12 in. machine fluted rollers, fitted with fast and loose pulleys and striking gear. All gearing completely protected by guards. These machines are made in two sizes.
2. **Sheeting Machine,** fitted with patent hot rollers for facilitating the process of drying the rubber for blocking or for increasing the output of a vacuum drier, or for dispensing with the vacuum drier.

This machine is fitted with fast and loose pulleys and striking gear. All gearing completely protected by guards. These machines are made in two sizes.

3. **Horizontal Direct-acting Steam Pump,** with 5 in. steam cylinder, 4 in. pump and 6 in. stroke, with gun metal valves and valve seats. Capacity, 2,600 gallons per hour.

This pump is an example of the pumps manufactured. All types of Pumping Machinery suitable for Rubber Plantation Estates constructed.

4. **The "Walton" Patent Seatless Stop Valve,** in all sizes from ½ in. to 3 in., for steam or water.

Exhibit No. 92.

Evans Bros., Printers and Publishers, Byron House, Fleet Street, London, E.C.

Offical Publishers and Printers to the International Rubber Exhibition. Publishers of this Catalogue and also of The Official Record of the International Conference of Manufacturers, Planters, Chemists, etc., etc., held at the International Rubber and Allied Trades' Exhibition, Olympia, London, 14th to 26th September, 1908.

This volume will be the only Published Record of the Conference, and will be issued by authority of the Committee. It will also contain many papers and lectures by eminent Authorities on Rubber Producing and Manufacturing, together with the Report of the Manufacturers' Conference. Price 5/- net. Post free 5/6 (prepaid).

EXHIBITORS.

OFFICIAL PUBLISHERS to THE WORLD'S TOURING SPORTS, PASTIMES AND TRAVEL EXHIBITION, OLYMPIA, JUNE AND JULY, 1909.

OFFICIAL PUBLISHERS to THE WOMEN OF ALL NATIONS EXHIBITION, OLYMPIA, 1909.

PRINTERS: All classes of Printing executed in first-class style. Exhibitors' Orders received and executed during the Exhibition.

Translations made for Foreign Exhibitors.

Printing of Company Prospectuses a speciality.

VISITOR'S NOTES.

Exhibit No. 92A.

Robert C. Evans & Co., Advertising Contractors (Members of the Incorporated Society of Advertising Agents), 85, Fleet Street, London, E.C.

Advertising Contractors to the above Exhibitions. Telephone No. 5504 Holborn. The principals will be happy to see by appointment any firms desirous of undertaking any form of publicity.

Exhibits No. 93 & 94.

Holt Town Rubber Co. (W. OPENSHAW, Proprietor), The Mill, Holt Town, Manchester.

Light and Dark Substitutes. Every description of Re-covered Rubbers. Finest prepared Pigments for India Rubber purposes.

Exhibit No. 95.

Photographs and Plantation Rubber Exhibits.

Exhibit No. 96.

G. Van den Kerckhove, India Rubber Expert, Consulting Rubber Planting Expert, 20, Rue de la Ferme, Brussels, Belgium.

V.D.K. Rubber tapping knife for any rubber specie (five blades per handle).

Fumero V.D.K. apparatus for testing the latex by the smoking process (Para system). (Patented).

Fumero V.D.K. (detachable) apparatus for testing the latex by the smoking process. (Para system). (Patented).

Exhibit No. 97.

Rubber photos.

Exhibit No. 98.

Rubber photos.

EXHIBITORS.

VISITOR'S NOTES.

Exhibit No. 99.

"Societe Industrielle des Telephones," 25, Rue du Quatre Septembre, Paris.

Telephone apparatus. Arc lamps. Lighting instalments. Industrial Rubber. Tyre "L'Electric." Rubber Shoes. Electric wires and cables of high and low tension.

Exhibit No. 100.

The Bowman-Northway Patent Knives for Tapping Rubber. English Agent: HAROLD F. BLYTH, Stockton, Rugby.

Knives for tapping Rubber Trees.

Exhibit No. 101.

Rubber photos.

Exhibit No. 102.

Rubber photos.

Exhibit No. 103.

Tropical Life Stand. Planting and Scientific Journals and General Literature of interest to Planters, Merchants, Scientists and Medical Men residing in, or connected with, Colonial and Tropical centres, including:

JOURNALS.

"Tropical Life." Monthly. For those interested in Rubber, Tea, Cocoa, Sugar &c., in tropical and sub-tropical countries. Price 1s., or 10s. per annum. Payable in advance. Publishing office, 83-91, Gt. Titchfield Street, London, W.

"Journal of Tropical Medicine and Hygiene." Fortnightly. Devoted to Medical, Surgical and Sanitary work in warm countries. Includes selections from Colonial Medical Reports, also reports of the meetings of the Society of Tropical Medicine and Hygiene. This journal contains original articles of great interest to all medical men in the tropics. Often contains many half tone illustrations. Price 1s., or 18s. per annum. Payable in advance.

"The Jute Journal." Monthly. Being Hemp and Flax Spinners and Manufacturers, Rope and Twine Makers' Journal. The organ of the Jute, Rope and Twine Trades, with monthly Market Reports, &c., &c., and original illustrated articles. Price 6d., or 7s. 6d. per annum. Payable in advance.

"Journal of the Royal Army Medical Corps." Monthly. With original articles, Clinical Notes, articles on Travel, Translations, Correspondence, and corps news from the various military stations at home and abroad. Well illustrated. Price 2s., or 20s. per annum. Payable in advance.

"The Proceedings of the Royal Society of Medicine." Published Monthly, from November to July. Contains the reports of the various sections, with discussions on the papers read. Fully illustrated. Price, each part, 7s. 6d. net.

BOOKS. **Commercial Section.**

"The Future of Cacao Planting." By the Editor of "Tropical Life," with an Introduction by Sir Daniel Morris, K.C.M.G., D.Sc., D.C.L., &c. Being the last word on the laying out and maintaining Cacao and Cacao-cum Rubber Estates. Price 1s. net.

"The Fertilisation of Tea." A new work by Mr. A. Geo. Cowie, M.A., B.Sc., on the best and most economical methods of increasing tea crops. Price 2/6 net.

"A Handbook of the Gnats and Mosquitoes." Giving the anatomy and life history of the Culicidœ. By Lieut.-Col. Geo. M. Giles, I.M.S. (Retired), M.B. London, F.R.C.S. Royal 8vo. Second edition. With numerous illustrations and plates. Cloth boards, lettered. Price 23s. 6d. net.

Venoms, Venomous Animals, and Anti-Venomous Serum Therapeutics. By A. Calmette, M.D., Corresponding Member of the French Institute, and of the Academy of Medicine. Director of the Pasteur Institute, Lille. Translated from the French by E. E. Austen, F.Z.S. Beautifully illustrated with all the original plates. Strongly and handsomely bound. Price 15s. net.

And other important tropical literature.

EXHIBITORS.

VISITOR'S NOTES.

Exhibit No. 104.

For full particulars *see* Exhibit No. 85.

Exhibit No. 105

A. D. Cillard Fils, "Le Caoutchouc & La Gutta Percha," 49, Rue des Vinaigriers, Paris. The French Review, "Le Caoutchouc & la Gutta Percha."

The Universal Directory of the India Rubber, Gutta Percha and Allied Industries. Edited in French, German, and English.

One Dynamometer (patent applied for) for trials with India Rubber, Gutta Percha, Tissues, Threads, Wires, Ropes, etc.

A new Apparatus, called the Elasto-Durometer, which determines the elasticity of every kind of material: as India Rubber, Gutta Percha, Leathers, etc., etc., which is also to be used to determine the hardness of supple and flexible material.

Exhibit No. 106.

Dr. Rudolf Ditmar, Graz, Austria. Chemical-Technical Commercial Laboratory.

1. A sketch of the Caoutchouc Laboratory of Dr. Rudolf Ditmar in Graz, Austria (executed by the artist, Erwin Pendl, of Vienna).
2. A sketch of the Pupil's Laboratory of the Rubber Technical School of Dr. Rudolf Ditmar, Graz, Austria (executed by the artist, Erwin Pendl, of Vienna).
3. A "Journal for the Chemistry and the Industry of Colloid." Technical and scientific review for all industries working with inorganic and organic Colloids. First yearly publication. Edited by Dr. Rudolf Ditmar. Published by Steinkopf & Springer, Dresden, 1906.
4. "The Pyrogenic Decomposition (decay ?) of Caoutchouc," by Dr. Rudolf Ditmar. Publishers: Steinkopf & Springer, Dresden, 1904.
5. "The Analysis of Caoutchouc, Gutta Percha, Balata, and their additions (flux ?), with inclusion of the Chemistry of the mentioned substances," by Dr. Rudolf Ditmar. Publisher: A. Hartleben, Vienna and Leipsic, 1909.

Commercial Section.

Exhibit No. 107.

Gummi-Zeitung (India Rubber Journal), Berlin. (Offices in Dresden, Hanover, and Hamburg.) Trade Journal for the India Rubber, Gutta Percha, and Asbestos Industries, as well as for their allied branches. Organ for the whole surgical, technical, and electro-technical business. (Union, Deutsche Verlags Gesellschaft.

Is exhibiting 22 bound Yearly Editions from 1886–87 till 1907–8. Graphic reproduction of the development of the paper and grouping of the places of circulation.

Further, the following publications

About the Origin and Chemistry of India Rubber. Marckwald and Frank.
India Rubber and its Sources. Henriques.
Information about Materials for the India Rubber Technician. Marzahn.
A Voyage to an India Rubber Plantation in Columbia. Weber.
Characteristics of a Theory of India Rubber Vulcanisation. Weber.
Handbook of India Rubber Goods Manufacturing. Heil and Esch.
A Dictionary in Five Languages for the India Rubber Trade.
Gutta Percha. Obach.
The Young Man of the India Rubber Trade.
The Pyrogene Decay of India Rubber. Ditmar.
To the History of India Rubber Researches. Slingervoet Ramondt.
Views of the India Rubber Country.
Tables for Calculations of the Technical Value of Raw India Rubber
New Studies about India Rubber : India Rubber Researches. Fendler and Kuhn.
Instructions for Weight Calculations of Technical India Rubber Goods. Marzoll.
Tables for Weight Calculations of India Rubber Goods.
The Goods and Raw Materials of the India Rubber Trade as Objects of the German Foreign Trade.
The Goods and Objects of the Celluloid Trade as Objects of the German Foreign Trade.
India Rubber Address Book, 1903, 1904, 1905, 1906, 1907, 1908.
India Rubber Calendar, 1907, 1908.
Year-Book of the India Rubber Industry, 1906, 1907, 1908. Herbst.

EXHIBITORS.

Exhibit No. 108.

A. W. Leslie, 119, Stoke Newington Road, London, N., Scrap Rubber Merchant (Import and Export).

On this Stand will be found a large assortment of the various grades of Scrap Rubber, etc.

Mr. Alfred W. Leslie, who has had very many years' experience of the Rubber trade both at home and abroad, has acquired his knowledge first hand (right away from the tapping of the Rubber tree) by residing in several of the Rubber-producing States of South and Central America, will be personally present during the Exhibition, and hopes to have the pleasure of meeting his numerous friends of home and abroad, who are interested in the Rubber industry, to discuss present and future business.

French, German, Spanish, Italian, and Russian spoken.

VISITOR'S NOTES.

EXHIBITORS.

VISITOR'S NOTES.

Exhibit No. 110.

Otto Dillner, Torgauerstr 30, Leipzig-Neusellerhausen, Germany.

Specialities.—Seamless transparent Rubber Goods, such as Gloves, Finger-cots, Finger-stalls, Teats, in all shapes and sizes.

Calandered cut-sheet and transparent Rubber articles, such as Feeders, Douche and Valve Tubing, Teats, Bellows, Powder Distributors, Beer Waste Preventers, Fountain Pen Fillers, Ice Bags, Elastic Bands, Enemas, and all Surgical and Hygienic Rubber articles.

Vulcanite Goods, such as Fittings for Douches and Syringes.

Waterproofed articles such as Sponge Bags, Ice Bags, Bathing Caps, and Paddling Drawers.

Exhibit No. 110a.

Thomas Balshaw, Manufacturers' Agent, 111, Farringdon Road, London, E.C. (India Rubber, Ebonite, Asbestos, Gutta Percha).

Representing—

Otto Dillner, India Rubber Manufacturer, Leipzig.—Seamless Rubber Teats, Feeding Bottle Tubing, Douche Tubing, Check Sheet, Sponge Bags, Ice Bags, Bathing Caps, Aprons, and all Seamless Surgical Rubber Goods.

Gummifabrik Westend, G.M.B.H., Berlin.—Manufacturers of Ebonite-Vulcanite Sheets, Rods, and Tubes, and all Ebonite Moulded Pieces for Electrical and Engineering Trades.

Neumann & Boecler, Hamburg.—Manufacturers of Asbestos Millboards, Asbestos Yarns, Asbestos Cloths, Asbestos Rubber Goods, and Packings of every description.

Josef Reithoffer's Sons, Vienna.—Manufacturers of Reithoffer's celebrated Pneumatic and Solid Tyres for Cycles, Automobiles, Cabs, Omnibuses, etc. Rivalit Packing for Superheated Steam Joints, Bed and Hospital Sheetings, Paracelsus Cambric, India Rubber Heels, etc.

The Hanseatic Vulcanised Fibre Co., Ltd., Hamburg.—Vulcanised Fibre Sheets, Rods, Tubes, and all shaped articles of Vulcanised Fibre.

I keep large stocks of all classes of India Rubber Goods at my London warehouse for wholesale and export trade only, and will be pleased to submit samples and quotations upon receipt of inquiries.

EXHIBITORS.

VISITOR'S NOTES.

Exhibit Nos. 111 to 116.

Piggott Brothers & Co., Limited, 57, 58 & 59, Bishopsgate Street Without, London, E.C.

Tents.—For Exploring, Surveying, Mining, Engineering, &c.

Camp Furniture.—Folding Bedsteads, Tables, Chairs, Baths, Washstands, Hammocks, Clothing, Bedding, &c., Mosquito Curtains, Water Coolers, Camp Lanterns, Air-tight Trunks, &c. Special Tents and Equipment for West Africa and the Congo.

Exhibit No. 117.

Companhia de Mocambique, Beira, East Africa. London Office : 13, Austin Friars, E.C.

Exhibits.

Rubber (Raw) :

1. 6 Ceara Biscuits.
2. 5 Ceara Biscuits (cured with Creosote).
3. 9 Ceara Biscuits (smoked).
4. 1lb. Ceara Scrap.
5. 1¾lb. Ceara Scrap (smoked).
6. 3lbs. N'harasika Balls.
7. 33 N'harasika Slabs (smoked).
8. 10 N'harasika Sausages (smoked).
9. 22lbs. Ordinary Balls.

Rubber (Manufactured) :

10. Several Manufactured Articles made from Rubber grown in the Company's Territory.

Plants :

11. 2 Herbarium Specimens.

Photographs :

12. Ceara Rubber Tree 5 years old.
13. Characteristic habit of Landolphia Kirkii (Dyer).
14. Nursery of Para Rubber Trees on Gaura-Guara Company's Estates near Beira.
15. Flowering and Fruiting Shoots of the N'harasika Rubber Tree (Mascarenhasia Elastica, K. Sch. var.)
16. Flowering and Fruiting shoots of a recently discovered rubber producing Liade-Landolphia (near L. Buchananii Stapf.
17. N'harasika Rubber Tree (Mascarenhasia Elastica K. Sch. var.)

Exhibit Nos. 118 & 119.

Curios from Sumatra.

EXHIBITORS.

VISITOR'S NOTES.

Exhibit No. 120.

Nieto Rocha & Cia. of Bogota, Colombia.

Virgin Rubber (Sapium biglandulosum Tolimensis) from the "El Dorado," a plantation of Messrs. Nieto, Rocha & Co., in South America, Columbia, Tolima, Chaparral. The trees are twenty-five years old. They were planted too close together, and were uncultivated and untended for twenty years. The plantation is between 1,200 to 2,000 above the sea level. The trees are tapped on the spiral system. They are bled only once a year. The average production is about four ounces each tree. The latter coagulates spontaneously over the scission after it is dried on smoke.

Exhibit Nos. 121 & 122.

Th. L. A. Runge, Deli-Mœda Estate, Deli, Sumatra.

2 Round Ficus Rubber Blocks of 5 kilos each, which have been prepared without machinery of any kind and cured by means of smoke only.

1 square Ficus Rubber Block of 5 kilos, treated in somewhat different way from the former.

Special Note.—This Rubber has been rendered extremely tough and durable by means of smoke only.

Bundles of Tobacco Leaves of the following :

Marked B—dark brown coloured.
V—fawn coloured.
L—light brown coloured.
SL—light brown, dry and spotted.
1 *bundle each of these is crop* 1907.

Marked L—light brown coloured.
V—fawn coloured.
SL—light brown, dry and spotted.
2 *bundles each of these are crop* 1908.

Collection of Photos.

A Collection of Batak Curiosities as follows :

Nos.		
1.	Trestle with 3 Dolls	belonging to the boat (No. 26).
2.	,, ,,	
3 to 9.	7 Dolls.	
10–11.	Ornaments and Jewels.	
12–13.	2 Stone Idols.	
14 to 17.	4 Bottle Pipes.	
18.	1 Pocket Fire.	
19.	1 Rifle.	
20.	Satchel with Book.	
21 to 25.	5 Books.	
26.	1 Boat (to which belong the dolls Nos. 1 and 2).	
27.	1 Walking Stick.	
28.	1 ,, ,,	
29.	1 ,, ,,	
30 to 32.	3 Flutes.	
33.	1 Cartridge Pouch.	
34 to 36.	3 Music Instruments.	

Commercial Section.

No.
37. 1 Wood Mask.
38. 5 Bone Letters.
39. 7 „ „
40. 4 Bundles of Letters with Bones.
41. 3 Girdles of Bone Letters.
42. 1 small Brush.
43 to 57. 15 Bamboo Letters.
58. 1 Goblet with 3 Dice.
59. 1 Vessel with Idols.
60. 1 Drink Horn.
61. 10 Sarongs (hip-cloths as worn by the natives).
62. 1 Book.
63. 1 Tube.
64 to 83. 20 short Bowie Knives.
84 to 93. 10 medium-sized Daggers.
94 to 98. 5 Swords with Sheath.
99 to 101. 3 Swords with Sheath.
102 to 109. 8 Swords without Sheath.
110. 1 Chinese Sword.
111. 1 Ornamental Sword of Coins.
112–113. 2 Musical Instruments.
114. 1 Sword.
115. 1 Sword without Sheath.
116. 1 Sword with Sheath.
117 to 128. 12 small Bowie Knives.

20 Sumatra Birds.

EXHIBITORS.

VISITOR'S NOTES.

Exhibit Nos. 123 to 132.

Loan Collections, Photographs, Samples of Rubber, &c. For particulars *see* Exhibit No.

Exhibit No. 133.

See Brazilian Section.

Exhibit No. 133a.

Views of Henry Diaper & Co.'s Rubber Vaults, Liverpool.

Exhibit No. 134.

See Brazilian Section.

Exhibit No. 135a.

Plots of Land for Sale for Rubber-culture in JAVA and other islands of the Dutch East Indies. For full particulars as to whereabouts, photographic pictures of Rubber-trees growing on the Estates, and reports on the plots, apply to the under-mentioned firm.

Stücke Land geeignet für die Gummi Cultur zum Verkauf auf JAVA und andern Inseln der Niederländischen Ost-Indien. Vollstandige Auskunft mit Beziehung auf Liegung und Preis, Photographiën von daselbst wachsenden Gummi-Bäumen und Rapporte über die Länder zu bekommen von ücerstehender Firma.

Terrains à vendre pour la culture de Caoutchouc dans l'Ile de JAVA et autres îles des Indes Néerlandaises. Pour renseignements précis sur l'emplacement et les conditions de vente, photographies de caoutchoutiers croissant sur place et rapports sur les terrains en question s'adresser à la firme mentionée si-dessus.

De Iongh & Co., 4, Cullum Street, Fenchurch Street, London, E.C.

EXHIBITORS.

VISITOR'S NOTES.

Exhibit No. 136.

Stroud & Co., 182, Green Lanes, Finsbury Park, London, N. Telephone: 1159 North. Established 1840. Designs in Fresh Flowers made up to order. Floral decorators at over 30 London Exhibitions. We hold the largest stock of hanging baskets for Exhibition purposes in the trade, also some 20,000 palms, ferns, flowering plants, bay trees, shrubs, etc.

Our exhibit will consist of a general collection of plants for decorative art or for making dull corners bright with plants that will stand the London climate, etc.

Exhibit No. 137.

Capper & Sons, Colombo, Ceylon. London Office: 27, Mincing Lane, E.C.

Proprietors and Publishers of the **"Times of Ceylon."** Established 1882 This, the leading daily and largest newspaper of Ceylon, has a *European Circulation* equal to all the other papers combined, and in the planting districts three times as many subscribers as any other paper. It is now acknowledged by all residents to be *the* planting paper of this centre of tropical agriculture. It daily contains 48 columns of matter, and often now requires to be issued in 10 pages instead of 8.

The "Weekly Times of Ceylon." Published every Thursday on the departure of each mail steamer for Europe. It is an epitome of the week's news, and circulates largely in England, Southern India, the Straits, Java, Australia, New Zealand and South Africa. Copies are regularly placed in the Reading Rooms and Smoking Rooms of all the P. and O., Orient, Bibby Line and other passenger steamers entering and leaving the port of Colombo, *the fourth port of the Empire*, and the most frequented port of call in the world.

"Times of Ceylon" Christmas Number. The finest east of Suez. Consisting of 64 pages of fine art paper, beautifully produced and profusely illustrated. The cover gives yearly an interesting picture by well-known artists.

"Ceylon Tea Planters' Note-Book." By H. K. Rutherford and John Hill. 4th edition. "Indispensable to the Tea Planters." The standard work on Tea Planting; without a rival.

"Tropical Investors' Guide." A Register of Rubber (and Tea) Companies in Ceylon, Malaya, and elsewhere. The first publication of its kind of so comprehensive a character. This Guide consists of 297 pages of valuable information, chiefly for Investors in Companies dealing in Rubber, containing particulars of the Capital Shares issued, Directors, Secretaries and Agents, Bankers, Situation of Estates, Acreage with details of cultivation, Crops for 1906, Estimates for 1907, and Financial Results and Dividends of 231 Companies, with "Some Notes on the Plantation Rubber Industry," particulars of Rubber Growers' Association, etc.

And Publishers of many other Works connected with planting.

EXHIBITORS.

VISITOR'S NOTES.

Exhibit No. 137A.

Hill Siffken & Co. (The London Printing Alliance), Grafton Works, Holloway, London, N.

Designers and Printers of original and Business Producing Posters, Showcards, and all kinds of effective advertising matter.

Advertisers in search of bold, comprehensive ideas for pictorial advertisements are invited to consult us.

We have good ideas for the Rubber Trade.

Write for our illustrated Booklet, "Some Types of Posters," sent free on request.

Exhibit No. 138.

Kalisyndikat G. m. b. H., Agrikultur-Abteilung, Leopoldshall-Stassfurt, Potash Syndicate. London Agent, Mr. E. B. HADLEY, 117, Victoria Street, Westminster, S.W.

An interesting exhibit of crude and manufactured **Potash Salts,** and an instructive collection of tropical plants and products, representative of growth by manuring with different combinations of fertilisers and on different classes of soil, and pictures, diagrams, photos, etc., all showing in a clear and convincing manner, by the difference in the yields from plots manured with and without **Potash,** the extraordinary importance of applying this essential plant food constituent to the various tropical and sub-tropical crops.

Exhibit No. 139.

Great Central Railway.

Exhibit No. 140.

Midland Railway.

Exhibit No. 141.

London & North Western Railway.

Exhibit Nos. 142 to 145.

Photographs.

Commercial Section.

Exhibit No. 146.

Great Northern Railway, Kings Cross.
Photos, Paintings, &c., of their System.

Exhibit No. 147.

Great Western Railway, Paddington.
Photos, Paintings, &c., of their System.

Exhibit No. 148.

South Eastern & Chatham Railway, London Bridge, S.E.
Photos, Paintings, &c., of their System.

Exhibit No. 149.

London, Brighton & South Coast Railway, London Bridge, S.E.
Photos, Paintings &c., of their System.

EXHIBITORS.	VISITOR'S NOTES.

Exhibit No. 150.

The British Recovered Rubber Co., Ltd., 28, Exchange Street East, Liverpool.
"Amazon" Standard Grades of Recovered Rubbers, as supplied to the trade for the last 30 years.

Exhibit No. 151.

The Kearney High-Speed Railway Model, 17, Old Queen Street, Westminster, S.W.

This exhibit is of unusual interest on account of the great possibilities presented in regard to the all-important question of transit. The better and the swifter the means of communication employed in any country, the richer that country becomes, and the prospect of travelling several times as fast and at less cost than is at present the case is certainly alluring. With the Kearney High-Speed Railway system employed, this desirable development is attained, and although a full-sized line has yet to be constructed, the model now on exhibition amply demonstrates the claim made for it by the inventor, Mr. E. W. C. Kearney, that very high speeds may be attained without risk of derailment. The working model shown is one-sixteenth full scale, and the important point to be noted is that the rails and wheel flanges are all in strict proportion. In working railway models it is usual to make these considerably larger as compared with the other fittings, in order to overcome the liability to derailment existent with a relatively high centre of gravity. Even when this is done it is unusual to run a one-sixteenth model more than four or five miles an hour; but in the case of the Kearney High-Speed car an actual speed of over 20 miles an hour is attained, and this phenomenal rate for so small a carriage could be greatly increased did the length of the track allow.

Commercial Section.

Very high speeds are attainable on a single bearing rail as is used with the Kearney system, on account of there being no lateral oscillation. This fact has long been known to engineers, and many unsuccessful attempts have been made to enable trains to run on a single bearing rail. With the Kearney system, however, the difficulty has been overcome by the special design of the overhead guide wheels, which admit of a reasonable amount of vertical movement, and at the same time make only point contact with the guide rail. A simple method of points and crossings is also a feature of the Kearney system, which has hitherto been unattained with mono rails for high speeds.

By avoiding lateral oscillation, several important effects are produced. Not only does it mean very comfortable travel for the passenger, but also a great saving in power and a considerable lessening of wear and tear of the permanent way and consequent cost of upkeep.

The model track shows how the system may be adapted to tube railways as well as to surface lines. In the case of tubes, the use of lifts would be dispensed with owing to the ability of the trains to climb very steep gradients into the stations which would be constructed immediately below the surface. The grades of the model track are 1 in 3, but in actual practice they will not exceed 1 in 7 except in cases where a steeper incline is unavoidable. The principal expenses of tube railway operation, viz.: acceleration and the working of lifts, are by this simple method avoided. On some of the present tubes, gradients of 1 in 30 are in use, but the effect is so slight compared with what Mr. Kearney proposes, that it may be said that gravity for the purpose of acceleration has been practically neglected. Mr. Kearney has also been granted a Patent for a new method of constructing tube railways which will reduce the capital cost by half.

The portion of the model track supported by trestles shows how the system may be applied to surface and elevated lines. The standards in a full-sized railway would be placed every 21 feet (251 to the mile), and with Mr. Kearney's registered design combining circular arms with chordal stays these may be made of very light and graceful appearance.

The cost per mile of a first class track on the Kearney system for the attainment of speeds of 100 miles an hour and over, including sleepers, standards and 100 lb. rails, is about £3,000 for a single line and £5,000 for a double line. Immense savings would be effected in grading, as this would be reduced to merely rounding off the sharper changes of the contour of the country. The standards readily lend themselves for the purpose of carrying telephone, telegraph and power wires.

The Kearney system is undoubtedly the one for employment on all new lines of railway, especially in undulating or hilly country, owing to the cheapness of construction and working expenses, and the additional facilities attainable by its use. The registered office of the company formed to exploit the invention is at 17, Old Queen Street, Westminster, S.W.

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